

This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Saunders' Question Compends

LANE MEDICAL LIBRARY STANFORD STOR
L356 .SS3 1994
Essentials of nervous diseases and insan
24503406200

Essentials of Nervous Diseases and Insanity

John C. Shaw, M.D.

JUST ISSUED.

LANE

MEDICAL LIBRARY

Library

Dr. A. C. Crawford

N. SENN, M.D., PH.D.,

Professor of Surgery in Rush Medical College, Chicago, and in the Chicago Polyclinic.

PRICE, $2.00.

Send post-paid on receipt of price.

This the latest work of its eminent author, himself one of the contributors to the "American Text-Book of Surgery," will prove of exceptional value to the advanced student who has adopted that work as his text-book. It is not only the syllabus of an unrivalled course of Surgical Practice, but an epitome or supplement to the larger work.

Form A A—20m—Oct. 3, '93

IN PREPARATION.

A Manual of Surgery,

GENERAL AND OPERATIVE.

BY

JOHN CHALMERS DaCOSTA, M.D.,

Demonstrator of Surgery, Jefferson Medical College; Chief Assistant, Surgical Out-Patient Department, Jefferson Medical College Hospital; Surgical Registrar, Philadelphia Hospital.

A new Manual of the Principles and Practice of Surgery, intended to meet the growing demand by students and others for a medium-sized work which will embody all the newer methods of procedure so fully detailed in the larger text-books, but written in a concise, brief style.

Considerable space will be devoted to Surgical Bacteriology, Asepsis, and Antisepsis, with full details of the various methods of disinfecting instruments, the hands, etc., as well as the preparation of the various drugs and materials used.

The illustrations are mostly new, the long and close connection of the author with the Jefferson Medical College Hospital having given him unusual opportunities for obtaining original and thoroughly representative plates.

The book will be of a handy and convenient size of about 400 pages, printed on fine paper, and well *and substantially* bound.

PRICE:—CLOTH, $1.00; INTERLEAVED, FOR TAKING NOTES, $1.25.

Saunders' Question-Compends

Arranged in the form of Questions and Answers.

☞ THE LATEST, CHEAPEST AND BEST ILLUSTRATED SERIES OF COMPENDS. ☜

☞ *New York Medical Record*, August 23d, 1890:—
"Where the work of preparing Students' Manuals is to end we cannot say, but the Saunders series, in our opinion, bears off the palm at present."

University Medical Magazine:—"Best of their class that have yet appeared."

Southern California Practitioner:—
"Mr. Saunders' series of Compends are the best ever published in this country."☜

No. 1.—ESSENTIALS OF PHYSIOLOGY. Third edition. Finely illustrated. Revised and greatly enlarged by H. A. HARE, M.D. (Price, $1.00, net.)

No. 2.—ESSENTIALS OF SURGERY. With Appendix on Antiseptics. Fifth edition. 90 illustrations. By EDWARD MARTIN, M.D.

No. 3.—ESSENTIALS OF ANATOMY. Based on GRAY. Fourth edition. 189 illustrations. By CHARLES B. NANCREDE, M.D.

No. 4.—ESSENTIALS OF MEDICAL CHEMISTRY, ORGANIC AND INORGANIC. Fourth Revised edition. With an Appendix. By LAWRENCE WOLFF, M.D.

No. 5.—ESSENTIALS OF OBSTETRICS. Third edition. Revised and greatly enlarged. 75 illustrations. By W. EASTERLY ASHTON, M.D.

No. 6.—ESSENTIALS OF PATHOLOGY AND MORBID ANATOMY. Sixth thousand. 46 illustrations. By C. E. ARMAND SEMPLE, M.D.

No. 7.—ESSENTIALS OF MATERIA MEDICA, Therapeutics and Perscription Writing. Second edition. Sixth thousand. By HENRY MORRIS, M.D.

Nos. 8 and 9.—ESSENTIALS OF PRACTICE OF MEDICINE. By HENRY MORRIS, M.D. And an Appendix on URINE EXAMINATION. Illustrated. By LAWRENCE WOLFF, M.D. Third edition, enlarged by some 300 Essential Formulæ, selected from eminent authorities, by WM. M. POWELL, M.D. (Double number, price, $2.00.)

No. 10.—ESSENTIALS OF GYNÆCOLOGY. With 58 illustrations. Second edition. By EDWIN B. CRAGIN, M.D.

No. 11.—ESSENTIALS OF DISEASES OF THE SKIN. Second edition. 75 illustrations. By HENRY W. STELWAGON, M.D.

No. 12.—ESSENTIALS OF MINOR SURGERY BANDAGING AND VENEREAL DISEASES. Second edition, revised and enlarged. 80 illustrations. By EDWARD MARTIN, M.D.

No. 13.—ESSENTIALS OF LEGAL MEDICINE, TOXICOLOGY AND HYGIENE. 130 illustrations. By C. E. ARMAND SEMPLE, M.D.

No. 14.—ESSENTIALS OF DISEASES OF THE EYE, NOSE AND THROAT. 118 illustrations. By EDWARD JACKSON, M.D., and E. BALDWIN GLEASON, M.D.

No. 15.—ESSENTIALS OF DISEASES OF CHILDREN. By WILLIAM M. POWELL, M.D.

No. 16.—ESSENTIALS OF EXAMINATION OF URINE. Colored "Vogel Scale," and numerous illustrations. By LAWRENCE WOLFF, M.D. (Price, 75 cents.)

No. 17.—ESSENTIALS OF DIAGNOSIS. By S. SOLIS-COHEN, M.D., and A. A. GRIFFITH, M.D. 55 illustrations (some of which are colored), and a frontispiece. (Price, $1.50, net.)

No. 18.—ESSENTIALS OF PRACTICE OF PHARMACY. By L. E. SAYRE.

No. 20.—ESSENTIALS OF BACTERIOLOGY. Second edition, revised. 81 illustrations (some colored) and 5 plates. By M. V. BALL, M.D.

No. 21.—ESSENTIALS OF NERVOUS DISEASES AND INSANITY. Second edition, revised. 48 original illustrations. By JOHN C. SHAW, M.D.

No. 22.—ESSENTIALS OF MEDICAL PHYSICS. Second edition, revised. 155 illustrations. By FRED J. BROCKWAY, M.D. (Price, $1.00, net.)

No. 23.—ESSENTIALS OF MEDICAL ELECTRICITY. 68 illustrations. By DAVID D. STEWART, M.D., and EDWARD S. LAWRENCE, M.D.

☞ Sent post-paid on receipt of price. ☜

SAUNDERS' QUESTION COMPENDS, NO. 21.

ESSENTIALS

OF

NERVOUS DISEASES AND INSANITY:

THEIR

SYMPTOMS AND TREATMENT.

A MANUAL

FOR

STUDENTS AND PRACTITIONERS.

BY

JOHN C. SHAW, M.D.,

CLINICAL PROFESSOR OF DISEASES OF THE MIND AND NERVOUS SYSTEM, LONG ISLAND COLLEGE HOSPITAL MEDICAL SCHOOL; CONSULTING NEUROLOGIST TO ST. CATHERINE'S HOSPITAL, AND LONG ISLAND COLLEGE HOSPITAL; FORMERLY MEDICAL SUPERINTENDENT KING'S COUNTY INSANE ASYLUM.

SECOND EDITION, REVISED.

FORTY-EIGHT ORIGINAL ILLUSTRATIONS,

MOSTLY SELECTED FROM THE AUTHOR'S PRIVATE PRACTICE.

PHILADELPHIA:

W. B. SAUNDERS,

925 WALNUT STREET.

1894.

COPYRIGHT, 1891, 1893,
BY W. B. SAUNDERS.

Press of
W. B. SAUNDERS, PHILADELPHIA.

L 356
S 53
1894

INTRODUCTION TO THE STUDENT.

THIS little book is not intended to take the place of the larger and more complete works of Ross and Gowers, but to be used somewhat as a primer—for advanced students.

The limits of the book forbade the introduction of anatomical detail and physiological discussion. It is expected that the student will use, in conjunction with this volume, Edinger's Lectures on the Structure of the Central Nervous System, translated by Drs. Vettum and Riggs, and the small monograph of Dr. Wm. Browning on the Vessels of the Brain.

The headings, under which some of the diseases are arranged, must be looked upon as provisional; such as Acromegaly under Dystrophies, and Morvan's Disease under Peripheral Neuritis. By a further advance in our knowledge we may assign a different place to these diseases. The question of diagnosis has not been entered into fully, as it is believed that a knowledge of these diseases must precede a clear appreciation of their differential points.

A few diseases not frequently met with have been omitted. In the section on Insanity, the arrangement and descriptions have been made as simple as possible. Much more detail

51285

could have been given, and other phases of mental disorder described, but it is believed that too much amplification would have tended to confuse the student. If, with clinical teaching, a few outlines can be obtained, detail can be best and more readily added later.

There is appended to the end of the description of many of the diseases a Bibliography, or rather a list of references. Though this list has no pretension whatever to completeness, it may be of use to the student in looking up the subjects, if he so desires. Almost all the references are to the writings of American neurologists. These, it is believed, will be readily accessible to the student; and they so fully deal with the subjects as to make reference to foreign authors unnecessary. The works of Leyden, and of Charcot and his pupils Kussmaul, Nothnagel, Westphal, are all to be consulted, and are referred to in the description of the diseases.

I have to thank a number of medical friends for many kindnesses—the taking of photographs of cases for me, for which credit is given under the illustrations.

All the illustrations have been made by Mrs. J. C. Shaw from reproductions in pen and India ink from photographs or other illustrations.

BROOKLYN, N. Y., September 1, 1891.

PREFACE TO THE SECOND EDITION.

In the short space of time which has elapsed since the issue of the first edition no new facts have been developed which it is essential to add to a work of this size and object.

Errors which had been overlooked in the first issue have been corrected in this edition so far as they have been discovered.

August 1, 1893, Brooklyn, N. Y.

CONTENTS.

SECTION I.

INJURIES AND DISEASES OF THE PERIPHERAL NERVES.

	PAGE
CHAPTER I.—INJURIES OF NERVES	17
Peripheral Neuritis	20
Multiple Neuritis	21
Alcoholic Paralysis	22
Diphtheritic Paralysis	24
Lead Paralysis	25
Acute Infectious Multiple Neuritis	26
Morvan's Disease	26
CHAPTER II.—PARALYSIS OF THE PERIPHERAL NERVES	29
Paralysis of the Ocular Motor	29
Peripheral Facial Paralysis	30
Paralysis of the Musculo-Spiral Nerve	36
from Injury of the Brachial Plexus during Birth	37
CHAPTER III.—SPASM	40
Unilateral Facial Spasm	42
Spasm of the Splenius Capitis	43
Writer's Cramp	43
Thomsen's Disease	44
CHAPTER IV.—NEURALGIA	45
Neuralgia of the Fifth Nerve	45
Hemicrania, Megraine	46

PAGE

Cervico-Occipital Neuralgia 47
Cervico-Brachial Neuralgia 48
Sciatica 48
Herpes Zoster 49

SECTION II.

DISEASES OF THE SPINAL CORD.

CHAPTER I.—THE ACUTE INFLAMMATORY (?) DISEASES OF THE SPINAL CORD 51
Acute Spinal Meningitis 51
Myelitis 52
Compression Myelitis 54
Acute Ascending Paralysis 56
Myelitis of the Anterior Horns of the Spinal Cord 58
Myelitis of the Anterior Horns . . . 60

CHAPTER II.—THE DEGENERATIVE DISEASES OF THE SPINAL CORD 62
Progressive Muscular Atrophy 62
—Peroneal Form . 64
Lateral Amyotrophic Sclerosis 65
Syringo Myelia 67
Tetanoid Paraplegia 70
Locomotor Ataxia 72
Friedreich's Disease 80
Combined Sclerosis 84
Ataxic Paraplegia 84

CHAPTER III.—MUSCULAR DYSTROPHIES . . . 85
Pseudo-Hypertrophic Paralysis 85
Acromegaly 89
Localizations of Lesions in the Spinal Cord . . 91

SECTION III.

DISEASES OF THE BRAIN.

PAGE

Acute Meningitis 96
Meningitis Purulent 96
Tubercular 97
Chronic Hydrocephalus 98
Cerebral Hemorrhage 99
Occlusion of Vessels 101
Intercranial Tumors 103
Abscess of the Brain 106
Disseminated Cerebro-Spinal Sclerosis 107
Epilepsy 109
Paralysis Agitans 111
Spastic Hemiplegia in Children 114
Cerebral Localization 117
Aphasia 119
Subcortical Lesions 122

SECTION IV.

Chorea 134
Hereditary Chorea 135
Neurasthenia 136
Headache, Cephalalgia 138
Exophthalmic Goitre 140
Angina Pectoris 141
Unilateral Facial Atrophy 142
Hysteria 143
Vaso-Motor Neurosis 149

SECTION V.

INSANITY.

PAGE

CHAPTER I.—THE SIMPLE INSANITIES NOT CONNECTED WITH DEGENERATIVE NEUROPATHIC STATES 154
Melancholia 155
Mania 160
Senile Dementia 162
Dementia Terminal 163

CHAPTER II.—THE DEGENERATIVE INSANITIES . . 164
Paranoia 165
Hysterical Insanity 169
Periodic Insanities 169
Epileptic Insanity 172
Alcoholic Insanity 174
Imperative Conceptions 177
Hypochondria 182
General Paralysis of the Insane 184
Imbecility and Idiocy 188

ESSENTIALS

OF

NERVOUS DISEASES AND INSANITY.

SECTION I.

INJURIES AND DISEASES OF THE PERIPHERAL NERVES.

CHAPTER I.

Injuries of Nerves.

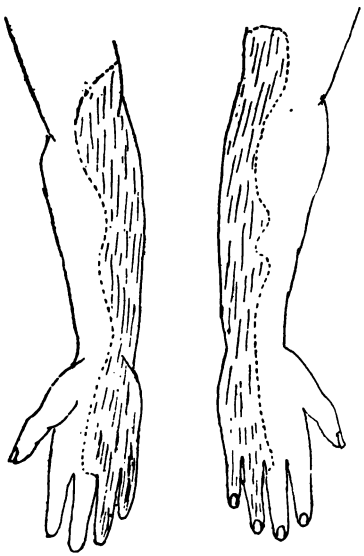
THE nerves may be injured as the result of gunshot wounds; tearing injuries by machinery; cutting by dull or sharp instruments; by falls; or from the pressure of cicatrices, tumors, bony exostoses, aneurisms in the subclavian, popliteal, or other arteries; from pressure during parturition; as a complication in fractures and dislocations; or from punctured wounds of the nerves themselves.

Symptoms. Pain is constant; it may be slight or severe; it is of a shooting, burning, or tearing character; most marked in the terminal distribution of the nerve or nerves injured, accompanied with a feeling of numbness and heaviness in the parts involved. Pressure on the inflamed nerve causes shooting, tingling pain radiating toward the periphery.

S. Weir Mitchell first described a painful burning sensation in the parts under the name of causalgia. These pains are often associated with glossy skin. In addition to this burning sensation, the parts are exquisitely sensitive; the least touch increases the pain. Exposure to the air and contact is avoided; the parts are kept carefully covered up with cloth, oil, water, vaselin, etc. As the pain increases the temper becomes irritable, sleep is dis-

turbed, the face exhibits a distressed expression. In severe cases trophic disturbances occur; the parts are bluish from impaired circulation. Bullæ may appear; there may be a little swelling of the entire limb below the injury, but greatest at the extremity; the joints slightly swollen and inflamed. The muscles in the distribution of the injured nerve may atrophy, and sometimes this atrophy is exceedingly rapid, and contracture more or less marked may follow. Changes in the nails are observed; they become deformed, brittle, curved, lose their smooth external surface, and appear rough and ridged. Anæsthesia is present in the severe cases, and is in the distribution of the injured nerve.

Fig. 1.



Shaded parts showing the area of anæsthesia in Drs. McNaughton and Wm. Brownings's case of injury to the ulnar nerve.

Ulcerations may occur in the parts supplied by the nerve; the skin and deeper tissues may slough in spots; the surrounding parts are red and inflamed.

Diagnosis. The history of an injury to the neighborhood of the nerve, the constant peculiar pains, the burning sensation, its limitation to the distribution of a single nerve or set of nerves associated together, and the trophic disturbances described, render the diagnosis comparatively easy.

FIG. 2.



Showing the ulcerated surfaces on the ulnar side of the forearm in Drs. McNaughton and Wm. Browning's case of injury to the ulnar nerve by puncture. Drawn by Mrs. Shaw from a photograph by Dr. Slee. The wrist is supported upon the fingers of the other hand.

Prognosis. Depends entirely upon the severity of the injury and the possibility of aid by medicinal or surgical means. Recovery is slow, even in the most favorable cases.

Treatment. In division of the nerve, suture of the divided ends of the nerve is indicated after a careful study of the case. For the indications and the methods of applying the suture, consult the special works on injuries of nerves and works on surgery.

In nerve injuries from pressure, the removal of the pressure is the first thing to be done if that is possible. In cases of lacerated wounds of the nerves, removal of any foreign body from the wound, soothing applications to the inflamed part; later, after subsidence of the inflammation, mild galvanism. If there results much inflammatory pressure, or the nerve is so badly lacerated that improvement does not occur, the advisability of cutting down and suturing the ends must be considered.

When the pain is very severe, morphia will be necessary to give relief, especially at night.

Peripheral Neuritis.

(Acute or Chronic, Inflammatory or Degenerative, Local or General.)

This is an inflammation of the peripheral nerves; it may affect only one nerve, such as the median or ulnar; or almost all the nerves may be affected, when it is called poly or multiple neuritis.

It is characterized by pain in the distribution of the nerve or nerves diseased; the pain is constant, but there are paroxysms of sharp needle-like stabs of greater or less severity; a sensation of tingling, heaviness, and formication is not unfrequent. It has numerous causes, and as the etiology somewhat modifies the clinical picture, we will consider some of the cases from that point.

It may occur without any assignable cause in the median or ulnar nerves, even in the musculo-spiral, as a somewhat acute condition. There is a feeling of pain, aching, and oversensitiveness in the peripheral distribution of the nerve, and to a greater or less extent in all the distal side of the diseased nerve; it will be found tender to pressure, and sometimes exquisitely so. In some cases the parts are a little swollen and the color is darker; there may be a burning sensation in the peripheral distribution of the nerve, and if the case is severe, all the symptoms described in cases of injury to nerves.

In neuritis of the median the thumb, index-finger, and the palm of the hand are the seat of the burning pain. If the case is severe, glossy skin, bullæ, and changes in the nails, etc., may follow. (See Injuries to Nerves.)

In these cases of acute and subacute local neuritis the nerves in the upper extremity are more frequently affected than any others.

Diagnosis. The distribution of the pain to one nerve; the peculiar pain; the burning sensation, etc.

Prognosis. Most of these cases recover under treatment.

Treatment. Active blistering with cantharidal collodion along the course of the nerve; applying another blister as soon

as the last one has nearly healed; the actual cautery may be used, but it is not nearly as efficacious as the blister. Iodide of potassa is sometimes used internally, but its utility is doubtful. Mild galvanism appears to give relief, if used often enough. Hot water applications are beneficial in the shape of douches. There should be complete rest of the part; for the relief of the pain phenacitin or antifebrin may be used, but if the pain is very severe, they are not sufficiently effective. Aconitia sometimes gives relief. Morphia with atropia is most effective to relieve pain and obtain sleep.

Multiple Neuritis.

(Poly Neuritis)

Etiology. Two main causes appear to operate: 1st. The introduction, or presence in the organism of some organic material which is poisonous to the system, and shows a decided tendency to more or less quickly disturb the nutrition and functions of the nervous system. 2d. The introduction of some inorganic material which has a poisonous influence. Of the first group, beginning with those which have been longest and best known, we have alcoholic excesses; the poison (whatever that may be) of diphtheria, typhoid, and typhus fever, variola, scarlatina, measles, enteric fevers, malarial fevers, puerperal disorders and epidemic influences, tuberculosis, rheumatism, diabetes, syphilis, etc. Multiple neuritis is known to follow all these conditions. It is also found in beri beri and leprosy, two conditions only rarely seen in this country, but prevalent, the one in Japan and the other in Oriental countries. The introduction of alcohol into the organism in excess appears to satisfactorily explain the neuritis and changes in the central nervous system; for that matter, in all the organs, by its constant irritation and disturbance in nutrition. But the explanation is not so clear in the others. We know really nothing of the material which gives rise to typhoid, diphtheria, enteric and malarial fevers. Then we have a class of cases, reports of which are just appearing in medical literature, in which the onset of

the neuritis is rapid and fatal. The discovery of the tubercle bacillus, and bacilli in other conditions, has turned the attention of pathologists to the possible relation between these organisms and these infectious diseases, and there is a tendency at this time to explain some of these neurites in this way.

Then the discovery that certain morbid products might be developed in the organism itself from the products of food used, or from the products of waste metamorphosis of the body; or, as has been found through the introduction of poisonous substances the products of the decomposition changes of milk, cheese, meat and fish (ptomaïnes, leucomaïnes, etc.). All these have given support to the theories now becoming prevalent that many of these cases of poly-neuritis are the result of some infectious material, either developed in the organism or introduced from without. It is thought that the source of this poisonous material is the bacilli of tuberculosis and other constitutional diseases. The bacteria are not supposed to be present in the nerves themselves, but only the poisonous substances to which their growth gives rise. Another possible source of infection is thought to be the decomposition products of the nerve tissue itself, which may be brought about by a variety of causes disturbing their nutrition.

Of the second group we have the introduction of mineral substances into the organism: lead, arsenic and its preparations, copper, mercury; and recently, Jacoby has reported two cases from carbonic dioxide poisoning.

The fact that this form of neuritis is generalized lends support to the theory that it is dependent upon some material which permeates the organism.

The etiology somewhat modifies the symptomatology; so that we shall consider some of the cases from that standpoint.

Alcoholic Paralysis.

At least two-thirds of the cases occur in women. This is in keeping with my personal experience. The lower extremities are the most frequently affected; but it not unfrequently affects

all extremities, and it is said the pneumogastric and the muscles of the face may be involved. Its onset is usually gradual. A creeping, tingling sensation with soreness is felt in the extremities; soon motor symptoms appear; the extensors are the first muscles to be paralyzed, producing in the lower extremity dragging of the foot, and in the upper drop wrist. There are sharp shooting pains in the parts affected. There is marked tenderness of the muscles to pressure, if the extremities are picked up suddenly or grasped firmly. The patient screams out with pain. This is commonly observed in women, who are apt to be emotional, and exaggerate their sufferings. There is a painful tingling in the soles of the feet, which is much increased by standing. They walk about with a hobbling gait, and great caution, fearful of increasing the pain. The paretic extremities are œdematous, bluish, owing to defective circulation. The tendon reflex is usually lost. In not a small proportion of these cases there is mental enfeeblement, memory is defective, and they may have delusions and illusions. There may be some muscular wasting, but it is not great in the majority of cases, the muscles becoming flabby and soft. Muscular atrophy may occur in the cases which become chronic. Then it is *en masse* as a rule, and there is partial reaction of degeneration. There may be retarded and perverted sensibility. In severe cases contracture may occur.

Diagnosis. The alcoholic history; the association of the motor weakness with the characteristic sensory symptoms in the extremities; the painful tingling in the feet when the patient stands; the excessive tenderness in the muscles; and the mental enfeeblement make the diagnosis.

Prognosis. A large proportion of these cases recover in six months to one year.

Treatment. Complete abstinence from alcoholic liquors, ample nutritious diet, keeping the extremities warm. Hot and cold douches. Tonics, small doses of quinia and strychnia. For the relief of the pains some of the remedies recommended in acute peripheral neuritis.

Diphtheritic Paralysis.

Diphtheritic paralysis occurs usually several weeks after the disappearance of the diphtheritic symptoms, and during the period of convalescence or after it. The muscles of the pharynx and deglutition, and of the neck are the most commonly affected; the voice becomes thick and indistinct; there is difficulty in swallowing; perhaps fluids come out through the nose in efforts to swallow, owing to paralysis of the soft palate. The paralysis in the muscles of the neck may be so decided that the child cannot hold the head erect. The paralysis of the extremities may be so slight as to cause only an unsteadiness of walk. One or more of the eye muscles may be paralyzed, and it is said one or both of the facial nerves may be affected. In severe cases the paralysis may be very decided and reflex action may be abolished, and there may be some disorders of sensibility, but they are not marked. There are none of the pains observed in alcoholic neuritis. The appearance of paralysis has no relation to the severity of the diphtheritic manifestations in a large number of the cases. I have seen paralysis follow very mild cases of diphtheria. In two cases the sore throat and constitutional symptoms were so mild that the children ran about, and it was not suspected that they had diphtheria.

Diagnosis. The diphtheritic history. The gradual development of a paresis during or after convalescence; its great tendency to affect the muscles of deglutition and the neck; its great frequency in children as compared with adults; the absence of marked sensory symptoms.

Prognosis and Treatment. The uncomplicated cases usually recover after some weeks. If the pneumogastric is very much involved, or there is bronchitis or pertussis, the prognosis is grave. Tonics and nutritious diet with cod liver oil, fresh air if the weather admits of being out of doors, and at the same time warm clothing.

Lead Paralysis

Occurs in persons who have been exposed to lead, such as workers in manufactories of white lead, and painters who are not careful to keep their hands clean. It first shows itself by increasing pallor and constipation, attacks of abdominal pain, "lead colic." There may be some pain in the joints and limbs, and a gradually approaching paralysis of the upper extremities, usually both. The extensors of the forearms are most affected, so that when the arms are held out the hand hangs down and cannot be extended from the wrist—"wrist drop." The common extensors of the fingers are first involved; then the extensors of the index and little finger and of the wrist. The supinator longus is not paralyzed unless in cases of exceptional severity. There is swelling of the back of the wrist from prolonged overflexion. The lower extremities may be affected; but these cases are quite uncommon. The tongue is coated, breath offensive, and there is usually a characteristic blue line at the junction of the teeth and gums. There are no true sensory symptoms, and no pains as in alcoholic neuritis. There may be disturbances of vision due to optic neuritis, or atrophy of the optic nerves; and even mental impairment has been observed, but it is not frequent. A certain amount of tremor may exist.

Diagnosis. The exposure to lead, the peculiar abdominal pain, the drop wrist with conservation of power in the supinator longus. The blue line at junction of gums with the teeth. The intense pallor, etc.

Prognosis. These persons usually recover after a number of months, if the cases are not of great severity.

Treatment. Sulphuric acid, or some of the alkaline sulphates, to wash out and eliminate the lead. Later, iodide of potassa in moderate doses. If there is much abdominal pain, it should be relieved with opium or codeia. The skin should be kept active by moderately warm baths and rubbing; the mouth and teeth brushed twice a day. Faradism or galvanism to the paralyzed muscles. Later, to relieve pallor, mild ferruginous tonics.

Acute Infectious Multiple Neuritis.

In the last few years, a number of cases of neuritis having an acute onset and rapid termination in death have been reported, with every indication of an infectious origin, notably by Rosenheim and by J. J. Putnam, of Boston. The study of this phase of neuritis is in its infancy, but it warrants a brief presentation here. The symptoms are from the observations of Rosenheim and Putnam, and from two cases seen by myself, which were quite evidently infectious neuritis, but were not fatal. A feeling of stiffness all over the body, muscles painful, motion increasing it, gait feeble and unsteady, feebleness in all the movements. Temperature and pulse not materially changed. A numb feeling in the extremities, but no true disturbances of sensibility. The nerve trunks tender to pressure. Tenderness on deep pressure of the muscles, and in my own cases tenderness at the joints, especially the shoulder joints, on pressure or motion. In Putnam's case strangulation on attempting to drink, talkativeness, restlessness, and expectoration of frothy mucus. Death followed rapidly in the severe cases.

Pathology. Swelling of the nerve fibres, breaking up of the myeline, absence of axis cylinders in places. Hemorrhages into the nerve sheath; this condition was widespread in Rosenheim's case. The spleen was enlarged and soft, and in Putnam's case multiple hemorrhages scattered through both lungs.

Morvan's Disease.

This disease was first described by Dr. Morvan, a physician of Bretagne, France, in 1883; later by Prouff, also a physician of Bretagne; by Charcot, and others.

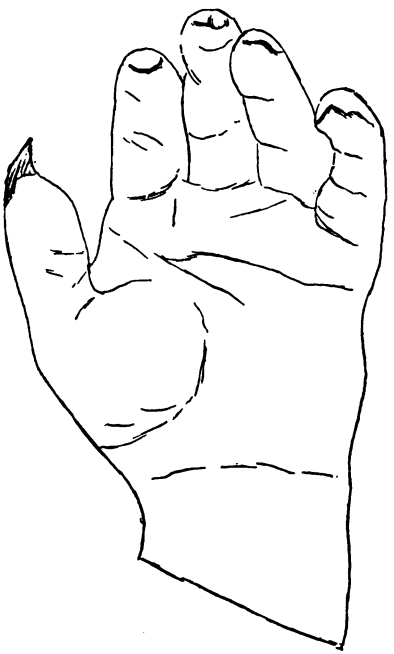
It is characterized by neuralgic-like pains in the arms and hands, followed by panaris, analgesia, anæsthesia, paresis, muscular atrophy, trophic disorders, and subsequent deformity of the parts, more or less marked.

Its evolution is exceedingly long—ten, fifteen, twenty, or more years. It appears, up to this time, to have been observed

principally in Bretagne; but isolated cases have been observed in other places. It occurs at all ages, from twelve to sixty years of age. Men are oftener affected than women.

Symptoms. Neuralgic-like pains in the fingers and hands are one of the earliest to appear. These are followed by panaris, which affects one or more fingers, and which may later appear on the others; it is usually associated with analgesia, but exceptionally it is absent, and these ulcerations are painful. Panaris

FIG. 3.



Showing the deformities of the hand from trophic disorders in Morvan's disease, from an illustration by Charcot (Le Prog. Méd. 1890).

begins with redness, heat, and swelling; it is very often extensive, involving not only the skin, but the subcutaneous tissue,

and the deeper parts, even the tendons, and there may be necrosis of the bones and destruction of the phalanges; from which there often result deformities of the hands. The lower extremities are rarely affected. Several of the fingers, sometimes nearly all of them, are the seat of these ulcerations. A long period of time may elapse between the involvement of each finger—from several months to several years. There are cases in which the panaris is painful, but in the majority of cases it is not; there is complete analgesia. Prof. Charcot has pointed out that the first ulcerations may be painful, while the subsequent ones are not. Besides this, there may be cracks and indolent ulcerations in the folds of the skin. The nails become deformed and may fall out, adding to the deformities. The hands are of a bluish color, owing to defects in the circulation. Broca has called attention to scoliosis of the vertebral column, and this has been observed in half the cases. Prouff has pointed out the presence of arthropathies of the joints, having the appearance of arthritis sicca.

The analgesia, which is marked and constant, is confined to the upper extremities, and explains the absence of pain in these ulcerated fingers. With this analgesia there is also anæsthesia; the tactile and temperature sense is much impaired or abolished.

Diagnosis. It may be mistaken for scleroderma, lepra, and syringo myelia. In scleroderma there is absence of true panaris, anasthesia, and necrosis of the bones. The deformities in scleroderma are due to the slow absorption of the tissues of the fingers, etc.

In lepra there is a history of residence in a country where leprosy exists; there are patches of morphæa over the body; there is no true panaris in leprosy, the ulcerations are gangrenous, and the lower extremities are as likely to be involved as the upper. In syringo myelia, to which it bears some resemblance, the muscular atrophy is more marked than in Morvan's disease, and is of the type of progressive muscular atrophy (Duchenne-Aran). The disturbances of sensibility differ. In Morvan's disease there are analgesia and anæsthesia; the pain, tactile, and temperature senses are abolished together. In

syringo myelia there are analgesia and thermo-anasthesia—loss of the temperature sense, heat and cold—over a large surface, but tactile sensibility is not impaired. This peculiar disturbance of sensation is characteristic of syringo myelia, and is found nowhere else except rarely in hysteria (Charcot). The trophic disorders may occur in syringo myelia, but they are rare, and are not a part of the clinical picture, as they are in Morvan's disease.

The **Prognosis** is unfavorable.

The **Pathology** is not clearly made out. An autopsy by Gombault points to its being a peripheral neuritis. He found changes in the peripheral nerves and sclerosis of the posterior columns. Morvan thinks it is due to some trophic disorder. Charcot believes it is due to a lesion in the parts of the spinal cord which preside over the trophic functions. Joffroy thinks it is syringo myelia under a different manifestation.

CHAPTER II.

Paralysis of the Peripheral Nerves.

PARALYSIS may occur in any of the nerves supplying the eye muscles; but paralysis of the 3d and 6th nerves is the most common.

Paralysis of the Ocular Motor.

This is most commonly caused by syphilitic lesions in the course of the nerve. It may occur after diphtheria, or in persons suffering from diabetes, or from intracranial tumors; from disease at the nucleus of origin in the pons, or from tumors in the substance of the brain injuring the nerve-tract.

If the entire nerve is paralyzed, there is drooping of the eyelid; and if it is extreme, the upper lid cannot be raised, owing to paralysis of the levator palpebræ superioris, causing a condition called ptosis. The superior rectus and the internal rectus are also paralyzed, and the eyeball is turned outwards.

But there may be paralysis in only a branch of the nerve. For example, affecting the internal rectus alone, or ptosis and paralysis of the superior rectus; and there may be dilatation of the pupil, with loss of reaction to light. If the paralysis is confined to one eye, it is due to a lesion in the course of the nerve after its exit from the brain; if the lesion is in the nucleus of origin, the paralysis may be on both sides—there will be double ptosis, and both eyeballs will turn outward. If there is tumor in the mid-brain, there will be the same condition. (See Diseases of the Brain.)

The **Prognosis** in these cases will depend upon the pathological condition which gives rise to the paralysis. If due to syphilis, recovery may be expected under anti-syphilitic treatment; if due to non-syphilitic intracranial or intracerebral tumors, the prognosis is unfavorable. When it occurs in the course of diabetes, it may pass away. This may also occur in some of the cases of locomotor ataxia; but in others it remains permanent.

Treatment. Electricity is sometimes applied in these cases. If there is evidence of syphilis, large and increasing doses of iodide of potass.

Paralysis of the sixth nerve or external rectus has the same causes as operate in paralysis of nerves to the other muscles of the eye; it gives rise to convergence of the eyeball and double vision, or diplopia.

Testing these eye muscles can be done easily and satisfactorily for a rough examination by having the person, while the head is fixed, look at your finger or a pencil held up in front of him and moving it first to one side, then to the other, upwards and downwards; at the same time observing the action of the muscles.

Peripheral Facial Paralysis.

(Bell's Palsy.)

This is a paralysis in the entire distribution of the facial nerve.

Etiology. Exposure to cold appears to be a frequent cause;

it may occur at all ages, but is most common between 20 and 50 years of age. Persons who are the subjects of some nervous disturbances, such as hemicrania, headaches, neuralgia, etc., are more disposed to this form of paralysis. It occurs suddenly in a large number of the cases which are supposed to be due to cold or rheumatism. It may occur as the result of severe injuries to the head, causing fracture at the base of the skull, from sabre cuts, or wounds by bullets injuring the nerve. It may be the result of the pressure of tumors in the neighborhood of the parotid gland, from suppurative otitis, with extensive disease of the bone. It may arise from the pressure of syphilitic periostitis in the bony canal or syphilitic meningitis and gummata, or in the course of the development of neoplasms (sarcoma and other tumors) at the base of the brain; but the symptoms then are not single paralysis of the facial nervé; other cranial nerves are involved, and other symptoms indicative of tumor are present.

Symptoms. There may be some premonitory symptoms, such as a general feeling of discomfort, chilliness, some headache, slight pain about the ear or the side of the head, slight noise in the ear, or tingling sensation in the side of the tongue. Often the person awakes in the morning to find the face on one side paralyzed, or his attention is first called to it by some person. The entire side of the face is paralyzed, the naso-labial fold is obliterated, the lower eyelid droops down so that the tears can run over on the cheek; there is a peculiar stare about the eye, owing to the paralysis of the orbicularis palpebrarum; that side of the forehead looks smoother than the other; all wrinkling of the skin is obliterated. If the person is asked to close the eyes tightly, he cannot close the affected eye; the ball is only partially covered. If the tongue is protruded, the upper lip on that side is observed to hang lower than the opposite side; it touches the tongue. In making an effort to whistle, the lips on the affected side do not contract as they do on the opposite side. The healthy side appears drawn up, and leads the student and friends to think that it is the affected side; it is due to the great contrast between the healthy muscles in tone and the flaccid paralyzed muscles on the other side. If the nerve is dis-

eased external to the Fallopian canal, all the muscles of the face on that side are paralyzed; if in the Fallopian canal and below the point at which the chorda tympani is given off, the muscles of the external ear in addition are paralyzed. If the disease is between the point at which the chorda tympani is given off, and the point of origin of the small branches of the stapedius, we have in addition abolition of taste in the anterior two-thirds of the tongue on that side, diminution of salivary secretion, and pain of a tingling and burning character in these parts may be present. If the geniculate ganglion itself is diseased, all the previous signs are present, and in addition paralysis of the soft palate and displacement of the uvula. At the very beginning of the paralysis there is an increased irritability to the faradic reaction, but it is, as a rule, soon lost, and we have for galvanism the reaction of degeneration. During the course of the disease, there is a good deal of annoyance and distress, due to inability to close the eyelids; dust is blown in, and in high dry winds the tears are rapidly evaporated; the inability to cover the ball from time to time allows it to become dry, irritated, and painful. This is much less troublesome in moist, damp, foggy weather. (The lip is in the way when they attempt to bite or chew, and often gets bitten.) Later, if the paralysis is not completely recovered from, there is a certain amount of contracture in the paralyzed muscles; there is a feeling of stiffness in them.

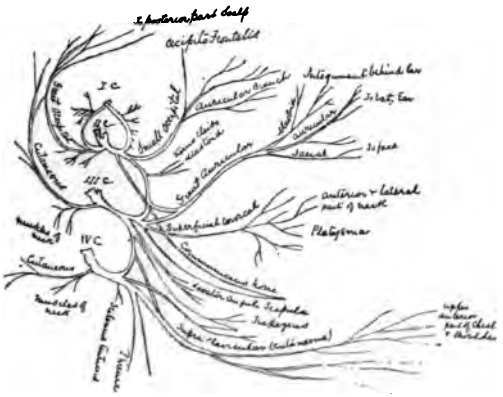
Diagnosis. In peripheral facial paralysis all the muscles supplied by the facial are paralyzed. If the person is directed to close the eyes, he cannot close the eyelids on the paralyzed side. In the facial paralysis from cerebral disease only the lower facial muscles are affected, and he can close both eyes equally well. There is an exception to this, and it is when there is a lesion in the pons or medulla; but these cases are exceedingly rare. (Refer to chapters on Diseases of the Brain.)

In cases due to fracture at the base of the skull there will be a history of severe injury, with perhaps bleeding from the ear, etc. From disease of the bones of the ear there will be a history of old suppurative inflammation of the middle ear, with an offensive bloody discharge.

In the paralysis due to syphilitic disease there will be headache and a slowly advancing paralysis, not sudden, as is the case with the common variety, also a history of syphilis, and there is very likely to be paralysis of some of the other cranial nerves; those supplying the eye-muscles are much oftener affected.

Prognosis. In the cases due to fracture at the base of the skull; to caries of the temporal bone, and to intracranial tumors, the prognosis is unfavorable. In those cases clearly due to syphilis, under appropriate treatment, recovery is the rule. In the cases due to cold, recovery is complete in some of the cases after a few weeks; in the more severe cases, recovery occurs only after six or eight months, and there is very apt to remain some slight impairment of the muscles and nerve on that side.

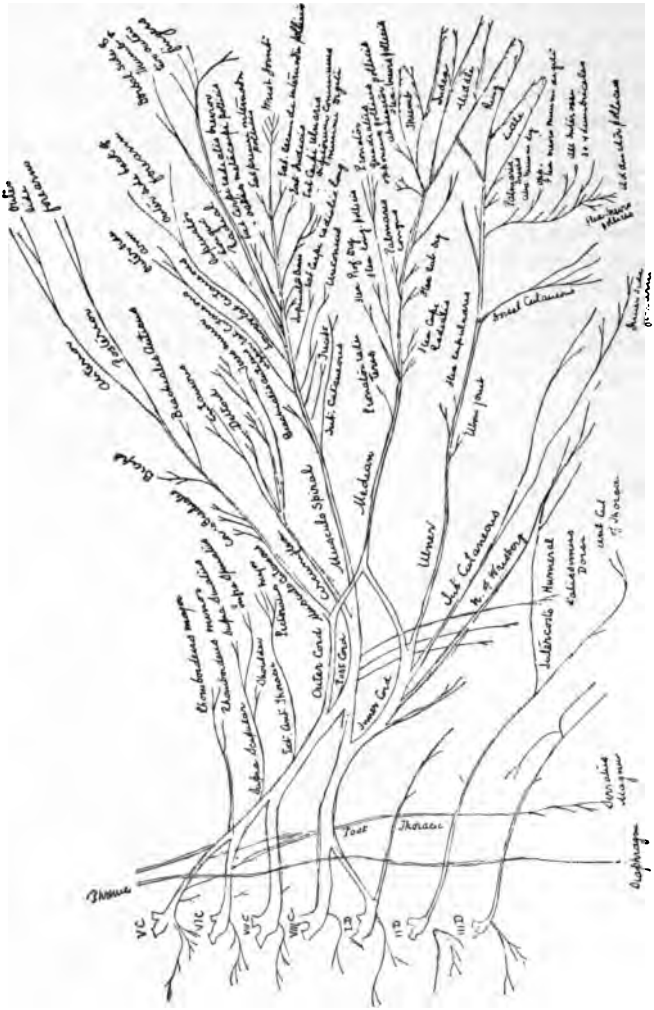
FIG. 4.



Cervical plexus of nerves. After Flower (Keen edition).

Treatment. Galvanism is to be applied every day to these paralyzed muscles. If there is much pain about the ear, a small blister will afford instant relief. If the person is in poor physical condition, tonics should be given. Iodide of potassa is sometimes given in these cases; but I doubt its being of any value, except in those cases which are clearly syphilitic; then it

FIG. 5.



Brachial plexus.

should be given in steadily increasing amounts until very large doses are taken ; inunctions of mercurial ointment should be used as well. In the cases due to intracranial tumor, unless gummata, there is no treatment which does any good. In the cases due to middle ear disease the condition of the ear requires treatment.

Paralysis of the median nerve causes inability to pronate and grasp objects with the hand, except with the two fingers which are supplied by the ulnar nerve. There may be a good deal of anæsthesia in the distribution of the nerve. Its most common cause is injury.

Paralysis of the ulnar abolishes the power to flex the last two fingers, of separating or of compressing them against the middle finger, of flexing the first and extending the second and third

FIG. 6.



Paralysis of the ulnar nerve. Clinic, Long Island College Hospital. Dr. Wm. Browning's case. From a photograph by Dr. C. N. Hoagland.

phalanges of all the fingers, and of adducting the thumb and placing it against the metacarpal bone of index finger. If the interossei and lumbricales are alone paralyzed, the combined

traction of the extensors and flexors of the fingers produces hyperextension of the first and flexion of the last two phalanges, and the hand assumes a claw-like appearance (see cut).

Paralysis of the Musculo-Spiral Nerve

Is most frequently due to injuries as it winds around the humerus. One of the most common causes is compression of the nerve from lying on the arm in such a way as to press against some hard substance. This frequently occurs in drunkards who fall in almost any place, on a hard floor, or on the stones in the street. When they awake the next morning the arm is found paralyzed, they cannot extend the wrist and the fingers; the thumb is flexed and abducted. They are unable to supinate the fore-arm; and it will be found that the supinator longus is paralyzed. This can be shown by having the patient flex the forearm upon the arm, and make resistance to passive extension. If, while you make the effort to extend it, a finger is placed on the supinator longus just below the elbow, it will be found to be quite flaccid-paralyzed. In plumbism the paralysis in the upper extremities is in the distribution of the musculo-spiral, and it presents, therefore, in that respect the same symptoms as in the condition under consideration. This difference in the condition of the supinator longus can be used as one of the points of differential diagnosis. In lead paralysis it is not involved; in paralysis from pressure it is. It is paralyzed by improperly adjusted crutches, and by injuries which partially or entirely sever the nerve. In these cases there is anæsthesia on the back of the hand and forearm.

Paralysis of the circumflex nerve is shown by paralysis of the deltoid. The arm cannot be raised upward or outward; the muscle is observed to remain relaxed in these efforts; and it frequently undergoes atrophy. Its most common cause is injury by falls or blows, and the muscle is more or less injured at the same time. There may be some slight aching about the shoulder.

Paralysis from Injury of the Brachial Plexus During Birth.

(Obstetrical Paralysis. Erb's Paralysis.)

This is a form of paralysis in one arm, occurring in very young children, from injury to the fifth and sixth cervical nerves by forcible traction on the head and neck during delivery by the obstetrician. The muscles paralyzed are the deltoid, biceps, brachialis anticus, infraspinatus and supinator longus, and occasionally the extensors of the hand. The arm hangs by the side; it cannot be raised from the shoulder, or flexed at the elbow, but the forearm and hand can be moved. In some cases the hand is flexed and rotated inwards; there is anæsthesia on outer side of shoulder and arm.

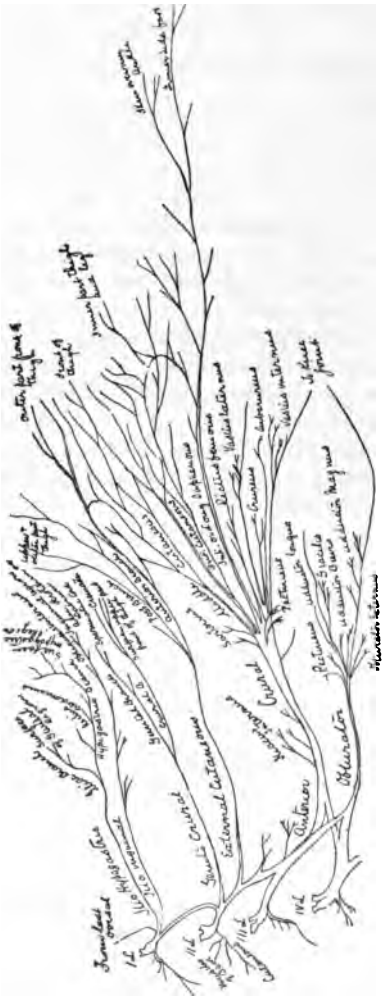
Erb considers the prognosis in these cases unfavorable; Starr has seen some of them recover. In the cases which I have seen, improvement took place, but was very slow; and I am unable to say if recovery occurred in any of them. Treatment. Galvanism to the affected nerve and muscles and friction. Starr recommends keeping the elbow flexed, and not allowing the hand to hang down to prevent overstretching of the shoulder ligaments.

Paralysis of the laryngeal branches of the vagus may occur from injuries, or compression of these nerves by tumors in the neck or mediastinum, by enlarged lymphatic glands, aneurisms in the arch of the aorta, carotid, and subclavian arteries. It is met with sometimes as a symptom in hysteria, in disseminated sclerosis, in bulbar paralysis, and in locomotor ataxia, and as the result of lesions in the corpus striatum and its vicinity. (See Diseases of the Brain.)

Symptoms. It may give rise to difficulty in breathing, difficulties in speech; depending upon the muscles paralyzed; or there may be paroxysms of spasmodic coughing, as when the nerve is irritated by the pressure of tumors or aneurisms, or as in locomotor ataxia (see that disease).

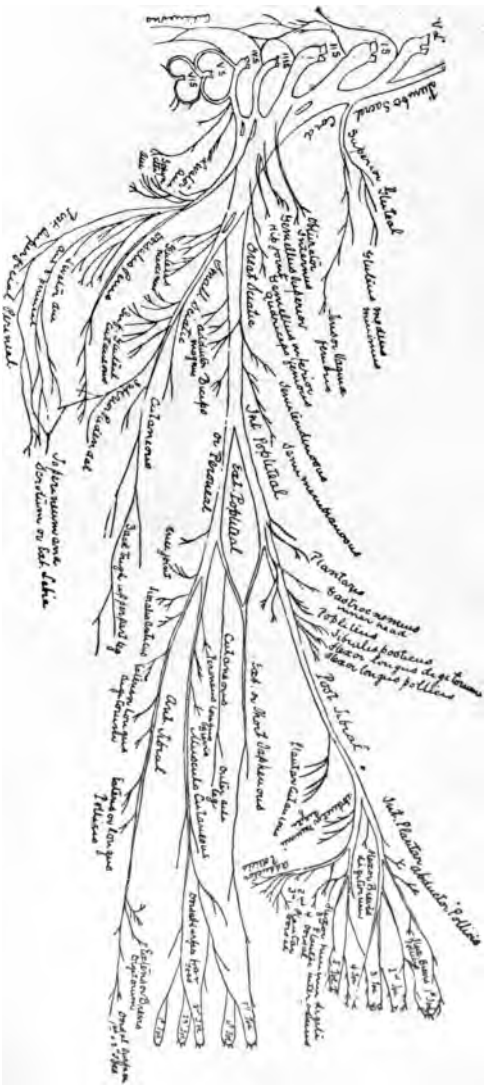
Paralysis of the lumbar and sacral plexus and its branches

FIG. 7.



Lumbar plexus.

FIG. 8.



Sacral plexus.

may arise from injuries, diseases of the vertebræ, tumors, abscesses, fracture of the thigh, etc.

Paralysis of the anterior crural nerve causes inability to flex the thigh on the hip, and extension of the leg. If sensory disorders are present, it is over the lower two-thirds of the thigh, the knee and inner side of the leg and foot.

If the obturator nerve is paralyzed, adduction of the thigh and crossing this leg over the other are impossible; outward rotation of the thigh is difficult. Anæsthesia is on the inner side of the thigh as far as knee.

In paralysis of the musculo-cutaneous and anterior tibial the foot cannot be flexed, but hangs down; in walking the toes drag, and the person is in danger of tripping; to avoid this the leg is lifted very high by flexion of the thigh on the hip and at knee. This is a condition frequently observed in infantile and other spinal paralyses. Sensory disorders, if present, are in the anterior and external part of the leg, dorsum of the foot and toes.

In paralysis of the trunk of the sciatic, all the muscles of the leg and foot are paralyzed. There may be all the trophic disorders described under injuries of nerves, and muscular atrophy may follow.

CHAPTER III.

Spasm.

SPASM may occur in the distribution of any of the peripheral nerves or its branches. Ordinary cramp or transient spasm is very common. A study of the cases and reference to the diagram of the nerves and their distribution to the muscles will be a guide. The commonly met with spasmodic conditions are as follows:—

Spasm of the muscles supplied by the spinal accessory nerve. It may be tonic or clonic. It is usually observed in persons of

a strong neuropathic tendency, those whose families are the subjects of hysteria, insanity, and other nervous disorders.

The immediate cause and the exact location of the irritation which give rise to these spasms are unknown. If the spasm affects the sterno-cleido-mastoid, the head is drawn backward and to one side, the chin turned upwards and to one side, and raised. If the trapezius is affected, the head is drawn backwards and towards the affected side without rotation of the chin, the shoulder is raised. It is rarely confined to the muscles supplied by the spinal accessory; the splenius is often affected; lateral curvature of the spine may be observed in some of the chronic cases. It usually begins with uneasiness in the neck. Soon the head begins to be turned slowly to one side; as soon as the spasm relaxes, the head returns to the normal attitude. The spasm is repeated again in a short time with the same relaxation. The frequency with which this recurs varies. As the

FIG. 9.



condition becomes more chronic, the head may remain permanently in that position. At first, by an effort of the will or the hand, the head can be brought to the normal position, but it at once, upon being released, returns to the abnormal attitude.

Prognosis is not favorable in these cases. Some of them re-

JUST PUBLISHED. SECOND EDITION.

A MANUAL

OF THE

PRACTICE OF MEDICINE.

BY

A. A. STEVENS, A.M., M.D.,

Instructor of Physical Diagnosis in the University of Pennsylvania, and Demonstrator of Pathology in the Woman's Medical College of Philadelphia.

Post 8vo., 502 pages. Illustrated.

PRICE, Cloth, $2.50.

Sent post-paid on receipt of price.

W. B. SAUNDERS, Publisher,

PHILADELPHIA, PA.

Contributions to the science of medicine have poured in so rapidly during the last quarter of a century, that it is well nigh impossible for the student, with the limited time at his disposal, to master elaborate treatises, or to cull from them that knowledge which is absolutely essential. From an extended experience in teaching, the author has been enabled by classification, the grouping of allied symptoms, and the judicious elimination of theories and redundant explanations, to bring within a comparatively small compass a complete outline of the Practice of Medicine.

W. B. SAUNDERS, Publisher,

925 Walnut Street, Philadelphia, Pa.

a strong neuropathic tendency, those whose families are the subjects of hysteria, insanity, and other nervous disorders.

The immediate cause and the exact location of the irritation which give rise to these spasms are unknown. If the spasm affects the sterno-cleido-mastoid, the head is drawn backward and to one side, the chin turned upwards and to one side, and raised. If the trapezius is affected, the head is drawn backwards and towards the affected side without rotation of the chin, the shoulder is raised. It is rarely confined to the muscles supplied by the spinal accessory; the splenius is often affected; lateral curvature of the spine may be observed in some of the chronic cases. It usually begins with uneasiness in the neck. Soon the head begins to be turned slowly to one side; as soon as the spasm relaxes, the head returns to the normal attitude. The spasm is repeated again in a short time with the same relaxation. The frequency with which this recurs varies. As the

FIG. 9.



condition becomes more chronic, the head may remain permanently in that position. At first, by an effort of the will or the hand, the head can be brought to the normal position, but it at once, upon being released, returns to the abnormal attitude.

Prognosis is not favorable in these cases. Some of them re-

cover, but very few; and there is a great tendency for them to relapse.

Treatment is most unsatisfactory: of medicines, hypodermic injections of atropia in gradually increasing doses, beginning with the $\frac{1}{200}$ or $\frac{1}{300}$ of a grain twice a day, gives the best results, but it is not always successful. The nerve and the muscles have been divided but no permanent good results have been obtained. Recently, W. W. Keen, of Philadelphia, has devised and carried out an operation for the relief of this condition (Annals of Surgery, January, 1891). It consists in division and exsection of the posterior divisions of the first three cervical nerves by which the chief posterior rotators of the head, the splenius capitis, rectus capitis, posticus major, and the obliquus inferior are supplied.

Unilateral Facial Spasm.

It is supposed to occur in neuropathic subjects. Reflex irritations from the eyes, teeth, nose, or any inflammatory focus in the distribution of the corresponding branches of the fifth nerve are also asserted by some to be causes. I believe very little, if any thing, is known of the etiology of this condition. In all the cases which I have seen a careful examination of every possible source of irritation has been made without any satisfactory result. Almost all of them have been in women over 40 years of age; one was a woman of 25 years.

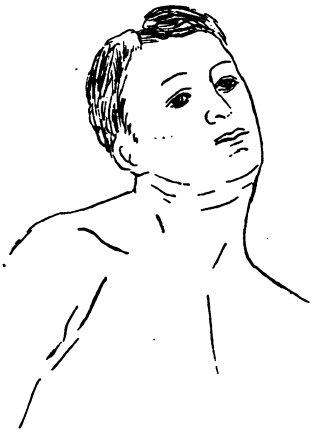
Symptoms. Clonic spasm in the distribution of the facial nerve; the muscles about the eye are more constantly the seat of the spasm, even when all the muscles take part paroxysmally in this spasm. Some cases are so severe that for the time being the eye is entirely closed, and the mouth drawn far to one side, the alæ of the nose also drawn up. It may last for years, but there are times when the paroxysms are much more frequent and severe than at others.

Treatment. I know of no treatment which gives the slightest relief in these cases, and this, after the most careful trial of all kinds of medicaments and electricity.

Spasm of the Splenius Capitis

Sometimes occurs; it causes the head to be drawn backwards and towards the affected side, the chin somewhat depressed and

Fig. 10.



directed towards the affected side. The spasm is principally tonic.

Writer's Cramp.

(And other Professional Hyperkinesis.)

Writer's cramp is one of a group of cramps met with in persons of a highly nervous temperament and of neuropathic inheritance, and developed by special occupations. It is a spasm in the muscles associated together in the performance of some work requiring delicacy and more or less long continued or severe action of those muscles, such as is required in writing, pianoforte playing, sewing, telegraphing, etc. In some of the cases as soon as the person attempts to use the hand the muscles

are seized with tonic or clonic spasms, so that the intended act cannot be performed. In others the attempt to use the hand brings on a tremulous condition, and if writing be the act attempted, it is uneven, coarse, and imperfect. In others, and perhaps the most common manifestation of the difficulty, the person experiences great fatigue, weakness, and aching in the hand and forearm, at times even in the shoulder; if the work or the pen be laid aside, the feeling may disappear. In such persons, if they attempt to write with the left hand, sooner or later it is affected in the same way as the right.

Thomsen's Disease.

This condition deserves a passing notice here. It is not frequently seen. It was first described by Thomsen, who was himself a sufferer. It is often inherited, and may appear in several members of a family. It is characterized by stiffness and rigidity of the muscles as soon as voluntary motion is attempted, and it may be so great as to prevent all motion. If they attempt to take hold of any article the muscles contract very slowly, but when the object is once grasped it is not readily released, as they in turn relax very slowly. Rest appears also to make the muscles stiff, and they experience great difficulty in beginning a voluntary act. In some cases the muscles of the back are affected, and there is a spasmodic lordosis; the movements of the tongue may be interfered with, and a patient of Ballet and Marie found that if he turned his eyes upward they became fixed, and he had difficulty in changing their position.

CHAPTER IV.

Neuralgia.

Neuralgia of the Fifth Nerve.

(Trifacial Neuralgia.)

HEREDITY is said to play a part in its predisposing causes. It has been observed to affect several generations of a family. It is frequent in those disposed to neuralgias and other nervous diseases. It is most common in middle and advanced life; it is more frequent in women than in men. Anæmia and general disorders of nutrition, from whatever cause, predispose to it. Malarial infection is a common cause; cold drafts from open windows, wounds, diseases of the parts in the neighborhood of the nerve and its branches, disease of the cranial bones, periostitis, exostosis, injuring the nerve as it passes through its bony canals; intracranial tumors; tumors developing on the nerve itself. Disease of the teeth and nose is an occasional cause.

Symptoms. Pain in the distribution of the nerve of more or less severity; it is sharp, shooting in character, coming in paroxysms. The entire nerve may be involved; but the ophthalmic or supraorbital branches are the most frequently affected. Supraorbital neuralgia. When the superior or inferior maxillary branches are implicated the pain is felt in the teeth. If the attack is severe, there is constant pain, with paroxysms of intense lightning-like pain. If the attack has been of some duration, tender spots will be found at various places, usually where the nerve becomes more superficial. The skin is often hyperesthetic, and in some chronic cases there may be some anæsthesia. After the attack is well established, the face is red and the local temperature may be elevated. The arteries on that side pulsate violently, and there may be an abundant flow of tears.

Prognosis. The majority of these cases recover; but there is a proportion which are very obstinate—those in which serious

nutritive changes play a part in the causation. There is also a proportion in which medicinal treatment does very little good.

Treatment. In those which have a suspicion of malaria as the exciting cause quinine 5 or 10 grains at night, and the $\frac{1}{100}$ of a grain of aconitia taken 2 or 3 times a day, preceded by a mercurial cathartic, will almost certainly cure them. This treatment will often cure cases that are apparently not malarial. Sometimes 15 or 20 grain doses of phenacetin will give the desired result. If there is anæmia, iron in one of its preparations should be given, or arsenious acid and a generous diet, with butter, fats, cream, or cod-liver oil, and fresh air with moderate exercise. In some troublesome cases, phosphorus may give some benefit. If it is suspected that the neuralgia is caused by carious teeth, they should be examined by some good dentist. Those cases dependent upon disease of the bones must be treated by the surgeon. In those cases incurable by medicine, operations on the nerve have often given relief for long periods of time. There is a tendency to recurrence of the pain even in these cases.

Hemicrania, Megraine.

(Sick Headache.)

This is essentially a neuralgia of the fifth nerve, with some special manifestations. Its most common cause is heredity, and a neuropathic constitution. Families in which there are hysteria, neurasthenia, epilepsy, asthma, dipsomania, and insanity are most likely to have it; and it is often transmitted directly. In these predisposed persons it may be brought about by all the causes which give rise to neuralgia in general. Excessive fatigue, anxiety, and worry often bring on an attack. It often begins in childhood or youth, and ceases at 40 or 50; but it may begin in advanced life.

It is most common in women.

It is characterized by headache which comes on in paroxysms and lasts for many hours. It is frequently located in one temple, and it is said in the left side most frequently. But in a large proportion of the cases it is more or less diffuse, extending

backwards to the occiput and neck or the top of the head, or it may be on both sides. The pain is usually dull, severe, and deep-seated, but there may be from time to time stabbing pain as in common neuralgia of the fifth nerve. At the outset or during the attack there may be tingling and numbness in the side of the face or arm; indistinctness of vision, hemianopsia, difficulty in speaking, aphasia, flashy or colored light before eyes. The arteries of the side of greatest pain may pulsate with great force; the face may be red or pale; light, noise, and motion are distressing; vomiting may or may not occur; the pupil may be slightly dilated on the side of greatest pain. As the attack subsides there is an abundant secretion of pale urine. The frequency with which these attacks occur varies very much. It is susceptible of relief, but it is not curable.

Treatment. If the nutrition is impaired, as it frequently is in the neuralgias, tonics, nutritious diet, cod-liver oil, cream, etc., are indicated, friction to the body by a coarse towel or rubbing with cold water. Extract cannabis indica in $\frac{1}{8}$ to $\frac{1}{2}$ grain doses combined with quinine and continued for some time does most good among the medicinal remedies used. For the relief of the paroxysms a number of things may be tried: glonoin, guarana, citrate of caffein, aconitia, and antipyrine; the three last are the most efficacious and certain. Some persons are relieved by one remedy which gives no relief to another. A remedy which has been efficacious in one paroxysm may fail in the next. Morphia gives relief in some persons, but it is a dangerous remedy, as these persons are very apt to contract the habit of taking morphia in spite of their thinking they never will. I have known morphia taken by the mouth to give very little relief. Antipyrine requires to be given in 15 grain doses to adults. Relief is in some cases obtained by 5 or 10 grains of menthol in hot water.

Cervico-Occipital Neuralgia

Is characterized by pain in the distribution of the occipital nerve, but it may and often does radiate into the distribution of the cervical nerves.

Cervico-Brachial Neuralgia.

The pain here is in the distribution of the cervical and brachial nerves, and is of the same character as in the neuralgias of the fifth nerve, but more constant and dull and less exactly localized. We may also have neuralgia in the distribution of the dorsal nerves; intercostal neuralgia; and in the lumbo-abdominal nerves.

Sciatica.

Of all the neuralgias, that of the fifth nerve and the sciatic are by far the most common. Sciatica occurs most frequently between the ages of 40 and 50, but it may occur in younger persons, especially those living in malarious regions. After 30 years of age it is most common in males. It may be caused by injuries, blows, and falls, from pressure during parturition; from sitting on hard seats; vertebral caries. Gout, rheumatism, and syphilis are among its most common causes.

The pain is in the distribution of the sensory branches of the sciatic. There is at first a feeling of heaviness and tingling in the leg, which tires easily and aches. When the pains begin they are lightning-like or tearing. Motion of the limb increases it, and sometimes the sensitiveness is so great that the person cannot move without severe pain, and has to keep in one position. The pain is usually felt at the back of the thigh down to the popliteal space. The outer surface and dorsum of the foot may also be painful. There may be more or less drawing up of the leg, and cramp in the muscles, especially at night. If the attack is of much severity and of long standing, there may be some wasting of the muscles.

Treatment. Sciatica is one of the most troublesome neuralgias to treat. For the malarial cases, large doses of quinine, preceded by a mercurial cathartic, and, if possible, removal from the region. Some cases will not recover while they remain in the malarious district. In those cases where there is a generally defective nutrition, this should be restored, if possible, by tonics, cod-liver oil, milk, cream, etc., attention to the assimilation and

secretions. In the syphilitic cases large doses of potass. iodide. In the rheumatic cases full doses of soda salicylate often give immediate results; alkalies and colchicum are also beneficial. There should be absolute rest to the limb. Galvanism often gives good results, relieving the pain; some think it is curative. The actual cautery and blisters often give good results. Sprays of methyline have been used in recent years with some success. In some obstinate cases stretching the nerve has been successful. To relieve pain phenacetin in full doses may be tried. Morphia may have to be used.

Herpes Zoster

Is the name given to an erythematous and papular eruption which comes on as a trophic symptom in neuralgia. The eruption is always along the course of a nerve or its branches. It is preceded by the stabbing pains and by a tingling, itching sensation along the course of the nerve or its branches. The eruption is very frequently in patches. The pustules may suppurate, and when they are large leave scars; or they may simply dry up and disappear without any after-symptoms. At times when it occurs in elderly persons there is a painful neuralgia in the nerve after the subsidence of the eruption, and it may last for years, indicating probably a serious change in the nerve. It may be found in association with neuralgia of almost any nerve—the fifth, the intercostals, those of the lumbar and sacral plexus. When it is in the fifth nerve it is the supraorbital branches that are its seat, and if the ophthalmic branches are involved there is danger of trophic disturbances of the cornea.

It is sometimes apparently due to epidemic influences.

Bibliography.—S. Weir Mitchell, Injuries of Nerves, 1864, 2d edition, 1872.—Bowlby, Injuries and Diseases of Nerves, 1890.—The Various Works and Encyclopædias on Surgery.—Buzzard, Some Forms of Paralysis Dependent upon Peripheral Neuritis, London Lancet, 1885, and Monograph.—Starr, Multiple Neuritis and its Relations to Certain Peripheral Neurosis, New York Medical Journal, 1887.—Miles, Diseases of the

LANE LIBRARY

Peripheral Nerves, Pepper's System of Medicine.—J. J. Putnam, Case of Acute Fatal Multiple Neuritis of Infectious Origin, Journal of Nervous and Mental Disease, 1890; Ross, Medical Chronicle, 1889 and 1890.—J. J. Putnam, Neuralgia, Pepper's System of Medicine.—Erb, Ziemssen's Cyclopædia of Medicine, vol. IX., Am. Trans.—Taylor, A Contribution to the Study of Multiple Neuritis of Syphilitic Origin, New York Medical Journal, 1890.

SECTION II.

DISEASES OF THE SPINAL CORD.

CHAPTER I.

The Acute Inflammatory (?) Diseases of the Spinal Cord.

Acute Spinal Meningitis.

(Lepto-meningitis.)

ACUTE meningitis confined to the spinal meninges is a very uncommon condition.

Etiology. As predisposing causes: the tubercular and scrofulous diathesis; weakly constitutions; residence in unhealthy, damp places, with poor food and clothing. It occurs after rheumatism and pneumonia. It may occur as a complication in localized disease of the spinal column, such as caries or tumors.

Symptoms. There is a feeling of heaviness, and lack of desire to move about, but a restlessness; pains in the back soon follow, with some elevation of temperature; irregular in type; pains radiating along the nerve-trunks, which may be severe or slight; cramps in the muscles of the extremities, so that the legs may be drawn up or kept in some unnatural position; the reflexes are increased; there is hyperæsthesia of the skin; retention of urine may be present; the bowels are constipated. If the disease increases, there will be opisthotonos; disturbances of respiration, and the muscular spasm gives place to paralysis in some muscular groups; in place of the hyperæsthesia, we find anæsthesia more or less marked.

The medulla may become involved: paralysis of muscles of the eye, and disturbances of respiration, and coma, followed by death. There are often periods of remission.

Pathological Anatomy. (See Meningitis, Diseases of the Brain.)

Myelitis.

(Inflammation of the Spinal Cord, Acute, Subacute, and Chronic.)

Acute, subacute, and chronic has reference only to the length of time the symptoms are in developing; it is a more or less active inflammatory process. It may involve only portions of the cord; to a certain extent functionally distinct tracts; systematized lesions, as in acute myelitis of the anterior horns; or it may be more or less diffuse, involving gray and white matter without regard to regions. It sometimes affects the cord all through transversely, involving white and gray matter for a limited distance vertically—transverse myelitis; at other times it may affect large portions of the cord—diffuse myelitis. Inflammation of the cord occurs under a number of circumstances; in all cases of compression of the cord—compression myelitis—but, as it has some features of its own, it is treated separately. It occurs as a somewhat chronic process in disseminated sclerosis. It may be set up at any time in a spinal cord, the seat of the degenerative diseases — locomotor ataxia, for instance.

Etiology. It is said to be caused by cold, damp, and exposure, over-exertion, falls, concussion, syphilis; after typhoid, variola, and other diseases, which impair the vitality of the system. It follows puerperal diseases and the puerperal state. Poisoning by lead, arsenic, etc.

Symptoms. These vary according to the extent of the lesion. Weakness, which may begin in one leg and extend to the other, causing difficulty in walking, weakness, and pain in back, numbness in legs, tingling, pricking at times; the limbs may tremble, and there may be some passing cramps in the muscles. These symptoms progress until the person becomes helpless; is confined to bed; the legs become weaker until they cannot be moved. If the disease progresses, the bladder becomes involved. At first there may be retention of urine; later, it dribbles away, and the bowels may act involuntarily; the numbness increases to anæsthesia, more or less great, according

to the severity and extent of the inflammation; a band-like feeling is felt across the body; if at first low down, at or below the umbilicus, as the inflammation extends upwards, the girdle sensation goes higher and higher, and it will be found that the anæsthesia follows pretty closely after it. This band-like sensation indicates the line of the inflammation; all the parts of the body below are more or less anæsthetic and paralyzed. Trophic disorders begin to appear; bullæ form on the feet and toes; cystitis is set up; the urine becomes ammoniacal, and is loaded with mucus; the unfortunate person aches unless the anæthesia is great, which it only rarely is; bed-sores form, and in men the penis may slough. The facial expression is pale, anxious, and distressed. There may be some elevation of temperature. As the disease extends upwards the respiration is involved, and death occurs by accumulation of mucus in the throat and lungs and involvement of the medulla. A case with these clinical features may run a course of six months or more before death occurs; others die in two or three months. The middle and lower dorsal region is the most frequent seat of this disease. The seat of the myelitis will somewhat modify the symptoms; its location can be fairly accurately determined by a study of the symptoms in each case: the motor disturbances; the sensory, the reflexes, etc., with the aid of the diagram of the spinal cord in its relation to the vertebral column, and the table of Starr. (Fig. 28.)

Diagnosis. The somewhat rapid onset of the symptoms as a motor weakness associated with the decided sensory symptoms, anæsthesia, if the disease progresses, the appearance of bed-sores, fever, often moderate, paralysis of bladder, etc.

Prognosis. In the severe cases with rapidly progressing symptoms, unfavorable as a rule; some cases of transverse myelitis recover. I have seen them recover when there were decided anæsthesia and almost complete paralysis.

Treatment. Ergot often appears to be of service; cupping to the spine, if there is good reason for thinking it due to syphilis; iodide potass. The urine should be drawn off, and if there is a tendency to cystitis, the bladder should be washed out every day with a solution of boracic acid.

The bed-sores can be treated according to Brown-Séquard's method of alternate applications of heat and cold—ice and hot poultices. One of the best applications, if not the best, for these bed sores is a mixture of iodoform in Peruvian balsam and absorbent cotton over it. The person should be kept clean, and pressure on the paralyzed parts prevented as much as possible; a water or air bed may be found necessary.

Bibliography.—S. G. Webber, Journal of Nervous and Mental Disease, 1880.

Compression Myelitis.

This occurs from pressure on the spinal cord by fractures of the spine, caries of the spine, tumors of the spine, or developed inside the spinal canal.

The onset of the symptoms may be either sudden or gradual, according to the cause of compression. In fracture it is sudden as a rule; in tumors and caries, gradual.

Symptoms. There is a grouping of symptoms common to these cases of compression. Paralysis more or less complete in all the parts below the seat of disease. Irritation to the nerves at the seat of disease as shown by pains, constant or darting, along the course of the nerves in the immediate neighborhood of the disease. Cramps in the muscles supplied by these nerves. And there may be anæsthesia in their distribution, if the pressure is sufficiently great to injure them. If the pressure is very great, so as to compress the cord very much or cut it across, then anæsthesia may be more or less complete in all the parts below; the functions of the bladder are disturbed; the urine has to be drawn off, it dribbles away. There are pain and aching in the hips and legs. Trophic disorders soon appear. If the compression is decided and sudden, they come on early and rapidly. If the cause of compression is slowly operative, they come on later and progressively. They consist in the formation of bullæ and ulcerations on the paralyzed extremities and bed-sores with cystitis. If the disease is in the mid-dorsal region, what has been called "spinal epilepsy" occurs. It is a spasmodic twitching of

the lower extremities; muscular wasting may be present. The paralyzed parts look bluish. There may be a moderate elevation of temperature. The pulse rate is increased, and is usually out of proportion to the elevation of temperature. There is frequently vomiting. The reflexes are abolished at the seat of compression. If the pressure is high up, there is increase of the reflexes in the parts below.

In fracture of the spine the symptoms appear suddenly; the most common seat of fracture is at the fifth and sixth cervical and the last dorsal and first lumbar vertebræ; but it may occur anywhere.

The fractured bones are driven in upon the spinal cord, compressing it or cutting it off entirely. Occasionally, the compression does not occur at once, but later. Motion causes a displacement of a portion of the fractured bone to encroach upon the spinal canal.

In caries of the spine there are frequent symptoms of irritation of the nerves passing off from the seat of disease with, perhaps, some paresis and muscular wasting of the parts supplied by those nerves; and paralysis may come on slowly or suddenly. The paralysis in these cases comes on in two ways—either from breaking down of the carious bones and displacement of the fragments, or by the accumulation of pus at the seat of caries, which gradually presses the dura in upon the cord. There are cases in which the paralysis will come on suddenly in an old case of caries, and a good deal of improvement may occur in the paralysis afterwards. A careful and frequent examination of the spine in the early stages will reveal the presence of the diseased bone. In case of tumor the symptoms come on gradually, and there are many more irritation symptoms.

Pathological Anatomy. The most common form of tumor to develop in the spinal canal is syphiloma, sarcoma, and myxomata. Multiple tumors are sometimes found on the nerve-roots. They are usually sarcomata, and develop in the membranes and sheaths around the nerves.

The changes which take place in the cord vary. In the immediate vicinity of the compression, and at an early date, the cord is swollen, the axis cylinders are swollen, the myeline is

broken up, there are great vascularity and distention of the blood vessels, there may be some spider-cells; granular corpuscles are always found in the fresh state, later more or less wasting of the spinal cord occurs. Above and below the seat of injury secondary degenerations occur.

Treatment. Depends upon the nature of the compression; they are surgical cases, if the compression is due to caries or fracture. In cases of tumor the question of surgical interference must be considered. For its indications consult Thorburn, "Surgery of the Spinal Cord."

Acute Ascending Paralysis.

(Landry's Paralysis.)

Etiology. It is supposed to follow exposure to damp and cold. It is known to follow typhus and typhoid fever, variola and splenic fever. It is believed by many to depend upon toxic infection. Syphilis is supposed to be a cause.

Symptoms. There may be premonitory symptoms, such as aching and soreness, with tingling in the parts; headache and backache; or it may appear during the course or at the onset of some other disease. The first definite symptom is usually a weakness in both legs, which increases rapidly to complete paralysis, sometimes in a few hours; it soon extends to the arms; as the lesion extends up to the medulla, there occurs paralysis of the diaphragm and neck muscles; there is difficulty in swallowing and speaking, owing to paralysis of the muscles of speech and deglutition. The extremities are flaccid and powerless; there is no muscular atrophy; there are no alterations in the electrical reactions; the reflexes are lost; there are sensations of tingling, but no loss of tactile sensibility as a rule. There are no bladder or rectal symptoms; no bed-sores; the mind is not disturbed. It usually runs a rapid course of from three to ten days in death by arrest of respiration, owing to the implication of the medulla oblongata.

Pathology. The changes in the spinal cord which give rise to this rapidly increasing paralysis are not fully made out. In fact,

up to within a few years, observations made with great care have revealed no lesions of the cord; but more recently Immerman found in a case no changes in the central nervous system or in the peripheral nerves macroscopically. Microscopically the anterior horns were found to be the seat of an intense vascular injection and degeneration changes in the ganglion cells. The following year (1886), Soudeykein found diminution in the size of the anterior horns; the large cells had lost their processes, their shape was altered, and they had undergone granular changes; the central canal was obliterated and surrounded by a mass of granular cellular elements. This year (1891), Klebs, in the study of a case, has found that the central arteries of the cord are the seat of hyaline thrombi; the thrombosed area being the central gray tube on each side of the central canal; transverse and longitudinal sections showed vessels plugged with hyaline thrombi, which were directed towards the anterior horns; in the region of these blocked vessels minute hemorrhages (visible only with the microscope) were found, in which the blood-cells were fixed and stained; the greatly distended perivascular spaces were filled with a retiform coagulated substance in which were imbedded a few spheroidal cells possessing a single large nucleus. Klebs believes that Landry's paralysis is nothing more than an acute myelitis of the anterior horns, very rapid in its progress and termination. In a case recently reported by Hun no lesions were found adequate to account for the symptoms after a careful microscopic examination by Dr. Ira Van Gieson, and he was unable to confirm the finding of hyaline thrombi of the central arteries, as reported by Klebs. It may be fairly said that at the present time nothing definite is known of the pathological changes in this disease.

Prognosis. Unfavorable; it is a rapidly fatal disease. A few cases are reported as recovered.

Treatment. Up to this time no treatment has been of much service.

Bibliography.—Henry Hun, The Pathology of Acute Ascending Paralysis, New York Medical Journal, May 30, 1891. Additional references will be found in this article.

Acute Myelitis of the Anterior Horns of the Spinal Cord.

(Infantile Spinal Paralysis. Acute Poliomyelitis Anterior.)

Etiology. It occurs in children during the first ten years of their life, but is most common from birth up to three years of age. Boys are more often affected than girls; but Gowers thinks this is only so in those cases which occur under two years of age. Sinkler, of Philadelphia, first pointed out that the disease was very much more frequent in summer than in winter, and that the largest number occur from May to September. Cold has always been assigned as a cause; but Sinkler's observations throw doubt upon this. The children are often apparently well when they are suddenly attacked; it may occur after diarrhœa, some of the eruptive or malarial fevers.

Symptoms. The onset is usually sudden. As premonitory symptoms there may be some languor and irritability. There is usually more or less fever of short duration. The attack may be ushered in by a convulsion; or the child may be put to bed apparently quite well; it is restless during the night, and in the morning it is found to be paralyzed in some of its extremities. The two lower extremities are the most commonly affected. At first there is a good deal of sensitiveness about the paralyzed extremities; if they are handled, the child screams; this lasts a few hours or a few days, and subsides. After a week or so, some of the paralyzed muscles may recover, leaving others permanently weakened. The distribution of the paralysis is variable; the lower extremities are the most frequently affected, one or both legs; the upper extremities, the muscles of the neck and back may be paralyzed; or it may be hemiplegic in distribution; but this is rare. There are no sensory disorders. Reflex action is lost in the paralyzed parts. There are no rectal or vesical disturbances. The parts which remain paralyzed soon show trophic disturbances. The muscles begin to atrophy, the parts are bluish and cold, the circulation is defective, chilblains form easily; whenever there is any undue pressure from a shoe or brace, sores form. The muscular atrophy becomes extreme

in some cases; as a consequence deformities arise. Talipes equinus and varus are the most common. These deformities are brought about by one of three causes, but most probably by a combination of some of these conditions: 1. It is believed by some that they are due to the predominant action of the healthy muscles. 2. Volkman believes it is due to the weight of the limb itself. 3. That the healthy muscles are constantly shortening, owing to the absence of the power of their antagonistic muscles. As the child grows, the paralyzed limb does not develop in keeping with the healthy one; there is retarded development. The bones are shorter and smaller, so that when the child grows up the paralyzed extremity is shorter and smaller than the others. The electrical reactions for faradism are very much diminished or lost; the galvanic reaction varies from simple diminution to complete reaction of degeneration, or even entire absence of reaction.

Pathological Anatomy. Autopsies early in the course of the disease are not frequent. In such cases the anterior cornuæ corresponding to the affected parts are found very vascular, the capillaries are distended, and there are minute extravasations of blood in the gray substance; the ganglion cells are swollen, granular, and their processes indistinct; there may be infiltration of leucocytes to a moderate degree. In autopsies made many years after the onset of the disease, the anterior horn is shrunken, the ganglion cells are absent, and the surrounding tissue is dense, and stains more sharply with carmine.

Prognosis. These children rarely die in the acute stage; death usually occurs years after of some other disease. Improvement may take place in some of the paralyzed muscles after a number of weeks; this cannot be predicted. Occasionally complete or partial recovery occurs.

Treatment. Tonics, cod-liver oil, attention to the diet, and general hygienic management, sponging with cold water, etc. For a long time galvanism has been used on these paralyzed muscles. I have seen but very little benefit from its use. If tried, it must be with the hope of keeping the paralyzed muscles from wasting, and improving the condition of the circulation

and nutrition; but in this you will often be disappointed. Massage may be of service. Later, if deformities arise, the orthopedic surgeon will aid you by dividing the tendons and placing the limbs in a comparatively useful position.

Bibliography.—Dr. E. C. Seguin, Myelitis of the Anterior Horns. Monograph.—Dr. Mary Putnam Jacobi, Pepper's System of Medicine.

Acute Myelitis of the Anterior Horns.

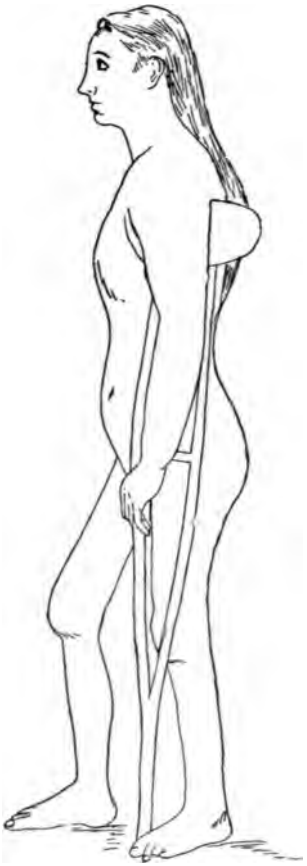
(Acute and Subacute Spinal Paralysis in the Adult.)

It may be acute or subacute in its onset; it has a very great resemblance to acute myelitis of the anterior horns in children; it is evidently the same disease, with some slight modifications in symptomatology.

Etiology. It occurs in adults; so far as is known, its cause is similar to that operating in children.

Symptoms. The onset may be somewhat sudden. There may be some elevation of temperature, tingling and pricking sensations about the extremities, with a feeling of numbness; some aching in the back; and in from 24 to 48 hours paralysis, more or less great, comes on, or it may develop much more slowly. It most commonly affects all extremities; but in a proportion of cases it is confined to the lower extremities—paraplegic. Rarely the face, eyes, tongue, and muscles of deglutition are affected. There is in some cases a very slight impairment of tactile sensation at first, but it is not lasting. Other than this, there are no true sensory disorders; there are no disturbances of the functions of the bladder and rectum; the paralyzed muscles may present fibrillary contractions, but this is only observed in the subacute cases. There is loss of faradic reaction and reaction of degeneration to galvanism. There may be some constriction feeling about the body or limbs. There is quite a marked tendency for the paralyzed muscles to recover, and in a large proportion of the acute cases recovery is complete; but in those cases where all the muscles do not recover, muscular atrophy occurs, and may become extreme, giving rise to contrac-

FIG. 11.



Acute spinal paralysis of the adult; showing the atrophy, deformities, etc., in the lower extremities. (After Seguin.)

ture and deformities. The circulation is poor; the extremities are purplish and cold.

Prognosis. The same as in children.

Diagnosis. The more or less rapid onset of motor weakness, without true sensory symptoms, the subsequent atrophy and deformities, absence of bladder and rectal disorders, disturbance in the electrical reactions, etc.

Pathological Anatomy. Is similar to that of acute myelitis of the anterior horns in children.

Treatment. Must be such as is adopted in children.

Bibliography.—E. C. Seguin, Spinal Paralysis. (Monograph.)

CHAPTER II.

The Degenerative Diseases of the Spinal Cord.

Progressive Muscular Atrophy.

(Chronic Myelitis of the Anterior Horns of the Spinal Cord.)

It attacks males oftener than females; not infrequently developing during convalescence from some acute disease, such as measles, acute rheumatism, typhoid fever, etc. It is thought to be caused by cold, excessive physical exertion, injuries, etc., but it often occurs without the possibility of assigning a cause—apparently as a degenerative process. Heredity is said by Schultze (Sachs) to be an important element in its causation.

Symptoms. It begins slowly, as a weakness in the upper extremity, usually, and more frequently in the right hand; there may be some aching in the hand. Soon the muscles of the hand are found wasting away. At other times the symptoms come on less slowly, with aching in the muscles and pains; the disease progresses more rapidly and the atrophy is more generalized. The atrophy extends from one muscle or one group to the other. In cases where the shoulder muscles are much wasted, the arms hang down by the sides, and the hands have a flattened flabby appearance. In some cases the legs are involved in the disease, but the atrophy is never so marked as in the upper extremities. As the disease progresses the medulla may be involved,

when we have in addition bulbar paralysis, the tongue is atrophied, it presents a shrivelled shrunken appearance, the muscles of the face and deglutition are weak, there is indistinctness in speaking, and later much difficulty in swallowing, owing to the paresis of the muscles of deglutition. In extreme cases much distress is caused by fluids passing up through the posterior nares and out of the nose.

Fibrillary contractions are constant in these atrophied muscles, and especially in the tongue. The tendon reflex is lost in all those cases in which the dorso-lumbar cord is involved. The faradic and galvanic reactions may be simply diminished. There are no sensory disorders in this disease; no bladder or rectal disturbance: the parts are cold and the circulation impaired.

Pathological Anatomy. Atrophy, granular pigmentation, and disappearance of the ganglion cells of the anterior horns. There is some thickening and change in the neuroglia; increase in the size of the bloodvessels; in fresh sections of the cord granular corpuscles may be found. The anterior horns later become shrunken; the anterior roots are somewhat atrophied. The disease is believed to begin in the anterior horns and its large ganglion cells; the anterior roots are diseased secondarily. The anterior horns and more especially its ganglion cells are the trophic centres for the anterior roots, motor nerves, and muscles. The disease of the anterior roots and the muscular atrophy are in relation to the extent of the lesion in the anterior horn; the slow and gradual disease of the ganglion cells explains the slowly progressing muscular atrophy, and as one portion after another of the spinal cord becomes affected the muscles of which it is the trophic centre waste.

Prognosis. Unfavorable. In some cases the progress of the disease is of many years' duration; in others it is more rapid, one, two, or three years; and if bulbar symptoms are added death may occur sooner.

Treatment. No treatment has exercised much influence over the progress of this disease. Tonics, cod-liver oil, and galvanism are indicated. Avoidance of the use of the muscles appears to have some influence in retarding the atrophy and prolonging the miserable existence of the person.

Progressive Muscular Atrophy.

(The Peroneal Form of Herbert Tooth.)

This disease is described here, although at the present time its exact place in the two large groups of muscular atrophy is not certain, as no pathological findings have shown if this be a disease depending upon a nervous or a muscular lesion; but there are many indications which justify its being placed, for the present, at least, with the muscular atrophies of nervous origin.

That it is an hereditary disease has been well established. It was first described by Charcot and Marie in 1886, and simultaneously by Herbert Tooth in England, and recently by B. Sachs in this country. A case of this disease, of which I have notes, was observed by me in 1876. I recognized it as different from the ordinary type of progressive muscular atrophy. It was in a young man aged 18, who had two younger brothers affected in the same way; it began at a very early age in each of them. It may begin from very early childhood to 20 years of age, and occasionally later. It begins simultaneously in both lower extremities as a progressive weakness and difficulty in using them; the muscles of the foot and leg begin to atrophy. It is a wasting of individual muscles, and progresses slowly; sooner or later deformities arise due to paresis and atrophy of the muscles of the anterior tibial and peroneal groups. This atrophy may be confined to the lower extremities, or it may extend to the upper extremities, and there may be the deformity of the hand known as "main en griffe." In a case of Sachs there was atrophy of the infraspinatus. In a case recently observed by me the hands only are at present affected. There are no sensory rectal or vesical symptoms. The tendon reflexes are present until a very late date. There are vasomotor disorders similar to what are seen in acute poliomyelitis anterior. There may be partial or complete reaction of degeneration.

Prognosis. The condition progresses slowly; death is caused by some intercurrent disease which may arise.

Treatment. The same as that indicated for acute poliomyelitis anterior.

Bibliography.—Charcot and Marie, Rev. de Médecine, 1886.—Herbert Tooth, Brain, 1888; and Thesis, 1886.—B. Sachs, Brain, 1888, N. Y. Medical Journal, 1888.

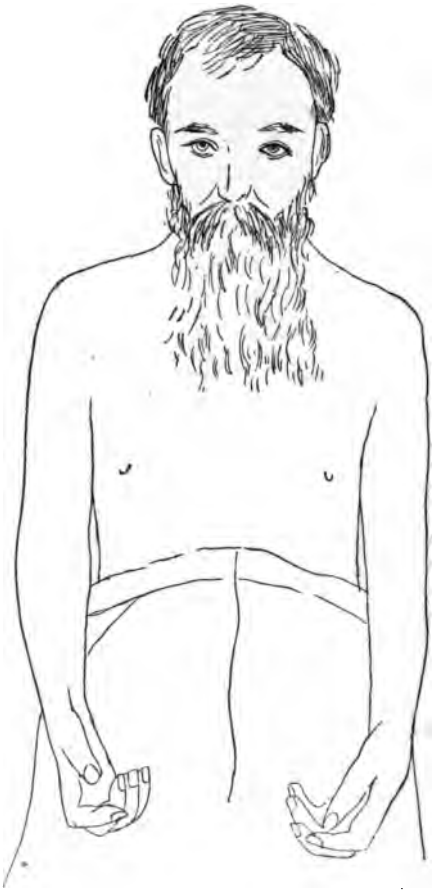
Lateral Amyotrophic Sclerosis.

This was for a long time confounded with progressive muscular atrophy until Prof. Charcot pointed out the distinctive features.

Etiology. It occurs chiefly between 30 and 50 years of age; men are most frequently affected. Very little is known as to its causation.

Symptoms. It usually begins in the upper extremities, but almost simultaneously in the lower (the majority of the cases I have seen began in the lower extremities), as a difficulty in motion. There is a certain amount of weakness in the members; even at this early stage the muscles are somewhat wasted; it is not in individual, or groups of muscles, as in the common type of progressive muscular atrophy, but is a more or less general wasting, an atrophy *en masse*, as Prof. Charcot says. This muscular wasting extends rapidly to the shoulders, neck, and chest, with paresis, out of all proportion to the muscular wasting. Soon the lower extremities show evidence of atrophy, but it is never so marked as in the upper extremities. The walk is spastic; stiff; the feet are not lifted from the ground, but dragged and shuffled along; the toes scrape the ground; the knees are stiff, and the muscles rigid. As the disease progresses the extremities become quite useless and stiff; contracture is more or less marked—in some cases it is very slight, indeed—and when the muscular atrophy is extreme, may disappear entirely. The reflexes everywhere are exaggerated. As the disease progresses the medulla soon becomes involved, and we have all the symptoms of bulbar paralysis—paresis of the muscles of the face and deglutition, atrophy of the tongue, difficulty in speaking and swallowing, and in the advanced stages there is great danger of food passing into the trachea. There are no sensory disorders, rectal, or vesical disturbances in this disease.

FIG. 12.



W.—Paresis; muscular atrophy; exaggerated reflexes; slight contracture in hands and legs. Shows peculiar attitude of hands. (Drawn from a photograph by Dr. Bristow.)

Prognosis. Unfavorable. Death takes place in two or three years after the onset of the disease from paralysis of the

respiratory centre, or from exhaustion due to the inability to take sufficient food, and from difficulties of respiration consequent upon the atrophy of the respiratory muscles and the accumulation of mucus in the lungs.

Diagnosis. The association of motor weakness with muscular atrophy and exaggerated reflexes; the early appearance of bulbar symptoms; the absence of sensory, bladder, and rectal disorders.

FIG. 13.



Sclerosis of the lateral columns in a case of lateral amyotrophic sclerosis. (Personal case.)

Pathology. The lesion is almost always strictly confined to the anterior horns and the lateral columns. In the anterior horns the changes are similar to those found in progressive muscular atrophy, gradual wasting, pigmentation, and absorption of the large ganglion cells; sclerosis in the lateral columns.

Bibliography.—Charcot, Diseases of the Nervous System.—J. C. Shaw, Journal of Nervous and Mental Disease, 1879.—Beevor, Brain, 1882 and 1886.—Ormerod, Brain, 1886.

Syringo Myelia.

For a long time it had been observed at autopsies that there were in some cases cavities in the spinal cord, but the fact was known only as a pathological curiosity. Olivier, in 1827, first used the name syringo myelia; he did not believe in a central canal in the spinal cord, and looked upon these cavities as an arrest of development. Later, it was clearly proved that there was a central canal in the spinal cord. Soon observations were recorded of an abnormal dilatation of the central canal, and they

were looked upon as arrests of development and described under the name of hydromyelia. Hollopeau, later, studied some conditions, somewhat analogous, under the name *diffuse peri-ependymal sclerosis.* In 1869 Grimm showed that the old syringo myelia, hyromyelia, and peri-ependymal myelitis was really due to a neoplasm developed in the centre of the cord. This view was adopted by Simon, Westphal, and Leyden; but later the work of Schultze (1882) and Kahler (1881) showed that this pathological lesion was associated with a certain grouping of symptoms. A large number of observers have added to the subject since.

Little is known as to its causation. The disease affects men oftener than women.

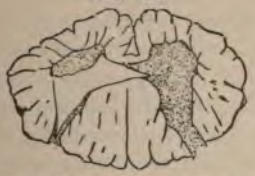
Symptoms. There is great diversity in the way in which the symptoms begin: Weakness in the hands or arms. A sensation of numbness may be felt. Muscular atrophy is added to the weakness; it is of the type of progressive muscular atrophy (see that Disease); it may begin in one hand or both. There are loss of sensibility to pain and thermo-anæsthesia; the person is unable to detect the difference between heat and cold on a more or less extensive area of the body; sometimes the person is not aware of this, and only an examination reveals it. Occasionally the patient finds that he has burns and injuries, and does not know when he received them—as in a case of Starr's and in one of my own. Tactile sensibility and the muscular sense are unimpaired. Sometimes the patient complains of pains, tinglings about the extremities, joints, and back, with headache. The reflexes may be either abolished or exaggerated. Scoliosis is spoken of as almost a constant symptom, and it is seated, according to Blocq, in the dorso-lumbar region with the convexity to the right. Trophic disorders are quite common. The muscular atrophy usually shows first in the hands and extends afterwards to other parts; it may begin in the shoulder muscles or in the lower extremities. Westphal, Schultze, and Grasset have each observed a case with facial paralysis. There may be fibrillary twitchings in the mucles. Electrical excitability is usually diminished. The skin is often affected with herpetic and eczematous eruptions, and the atrophy of the skin called

"glossy skin" has been described. It is said the nails may become cracked, furrowed, and thick; there may be an œdematous condition of the cellular tissue. The parts may be cold and cyanosed from defective circulation; slight irritation may cause persistent redness; the fingers may be swollen and red. The joints are sometimes the seat of arthropathies. The bones are thickened and often become brittle. (Dejerine.)

Diagnosis. Muscular atrophy, thermo-anæsthesia with preservation of tactile sensibility.

Pathological Anatomy. Cavities more or less large, situated generally in the posterior portions of the cord, but often encroaching upon the other parts; they are usually of irregular shape and may extend throughout the entire cord; these cavities are the result of a pathological change in the cord. There is a development of a glioma or gliosarcoma, either

Fig. 15.



Cavity in the gray matter. Syringo myelia. (Personal case.)

starting in the epithelial lining of the central canal or in the gray substance of the posterior horn or the gelatinous substance; the tumor develops in the posterior part of the cord and gradually increases; later, the central portion of the tumor breaks down and a cavity is formed; this may break into the central canal

Fig. 14.

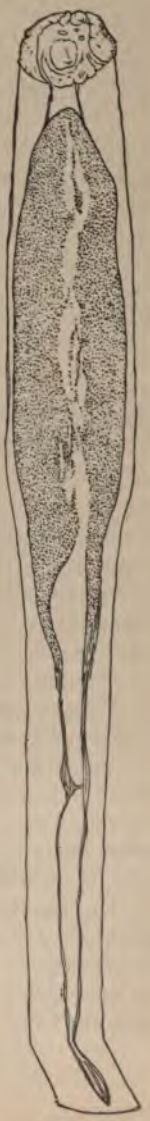


Fig. 14.—Showing the location and extent of the gliomatous tumor of the cord and cavity. (After Ira Van Gieson.)

if it did not start originally there; all below the tumor the central canal is dilated by œdematous distention. The cavity is lined by a tissue somewhat loosely arranged, with numerous spider cells and glia cells. There are in the tumor itself the glia, or, as in Van Gieson's case, gliosarcoma cells.

Bibliography.—Westphal, Brain, 1883.—Roth, Archiv de Neurologie, 1889.—Starr, American Journal Medical Sciences, 1888.—Van Gieson, Journal Nervous and Mental Disease, 1889.—J. C. Shaw, New York Medical Journal, 1890.—Blocq, Brain, 1890.—James Hendrie Lloyd, University Medical Magazine, March, 1893.—Complete bibliography will be found in Starr and Roth's papers.

Tetanoid Paraplegia.

(Spastic Spinal Paralysis; Spastic Paraplegia; Tabes Dorsalis Spasmodique; Primary Sclerosis of the Lateral Columns.)

This condition was first described by Dr. E. C. Seguin in 1873, in 1875 by Erb, and in 1876 by Charcot.

Etiology. Heredity is said to play a part in its causation; it is very probably secondary to other pathological conditions.

Symptoms. It begins as a weakness in the lower extremities; the legs tire easily, and if long walks are attempted, they tremble, give way, and feel heavy; the feet are not lifted from the ground as they are normally in walking, but shuffled along, and in the advanced condition they scrape along the floor; the knees are slightly bent; the legs present a rigid appearance; in motion they have lost the suppleness and flexibility at the joints observed in health; when the person sits down and arises again it is found that the muscles are very stiff, and it is with some difficulty that he arises; it is soon observed that the legs tremble, especially if the muscles are put on the stretch, as in any awkward position which the legs may be placed in. There may be spasm in the legs, especially at night; there may be some aching in the spinal column. If the legs are examined, they are found to be more or less rigid and resisting, owing to

muscular contraction ; the muscular power is good, only a slight weakness. The reflexes are very much exaggerated, and the so-called foot phenomenon or ankle clonus is marked. This is elicited by having the person press the tip of the toe against the rung of a chair, pressing hard against it, or by taking the foot in your own hand, and flexing it forcibly and quickly against the leg, at the same time making slight pressure above the knee to keep the leg steady. There are no sensory symptoms ; no vesical or rectal disorders ; no muscular atrophy ; no trophic disorders. The disease progresses very slowly ; it is often confined entirely to the lower extremities, but may involve the upper as well. Some cases of spastic paraplegia have been described in children ; but I believe these cases are due to some cerebral disease of which descending degeneration is the result, and should be kept apart from the condition here described.

Pathological Anatomy. A primary sclerosis of the lateral columns, if such a condition exists without lesion in other portions of the central nervous system, which I very much doubt. We have very little knowledge of primary lateral sclerosis ; in combination with lesions in other portions of the spinal cord more is known (see Combined Sclerosis, Friedreich's Disease, Lateral Amyotrophic Sclerosis, etc.). The location of this lesion will be found pictured in the cut of the spinal cord under Lateral Amyotrophic Sclerosis. The histological changes are the same.

Diagnosis. The exaggerated reflexes ; the muscular spasm, and the consequent spastic walk ; the gradual onset of the symptoms, and their slow progress ; the absence of symptoms indicating a localized transverse lesion ; the absence of sensory symptoms, of bladder and rectal disorders and trophic disturbances, and the appearance of the disease between 30 and 50 years of age.

Prognosis. Unfavorable as to ultimate recovery ; those suffering from it may live a great many years, and it may be confined entirely to the legs.

Treatment. Medication is useless, unless the general health is impaired. Massage, cold sponging, electrical treatment of a mild kind.

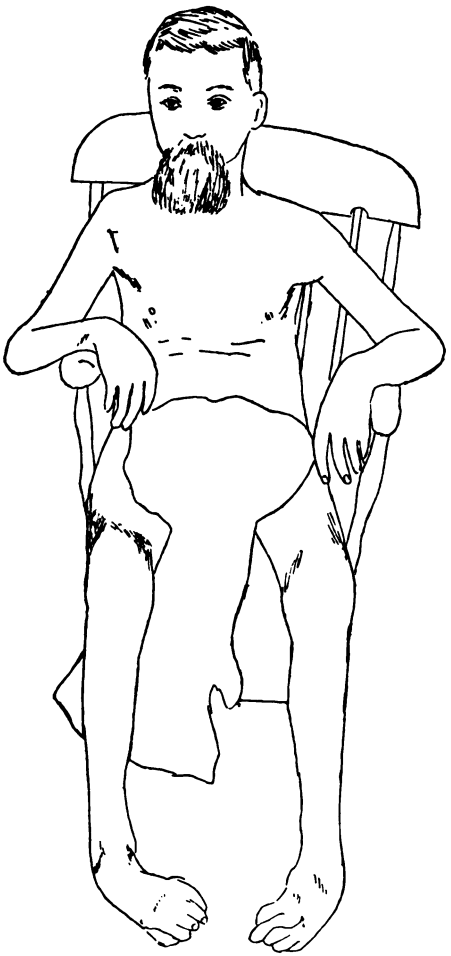
Locomotor Ataxia.

Etiology. It is most common between thirty and fifty years of age; it affects males oftener than females; a neuropathic constitution is the predisposing cause in all these cases. As exciting causes we have cold, damp, hardships of all kinds. It may follow some of the acute diseases; falls and injuries are said to act as exciting causes. Syphilis is a frequent cause; 75 per cent. (Erb, Seguin) of the cases have a syphilitic history; the syphilitic poison causes disturbances of nutrition, which lead to the degenerative changes found in these cases.

Symptoms. Lancinating, lightning-like pains, or boring in character, are very early symptoms, and are frequently mistaken for rheumatism, which they do not resemble in any way; they do not follow the course of any nerve-trunk, but shoot about in the various cutaneous branches. The lower extremities are generally first affected. These pains come on with great severity, in paroxysms, lasting a few hours or a few days and subsiding. They may precede the other symptoms for years. There is numbness in the feet and hands, and in places about the legs; the feet feel thick and heavy, and the patient may be unable to recognize the quality of the substances he walks on. Sensibility is retarded. The patella tendon reflex is lost; the pupils are contracted, usually alike, but one may be larger than the other; there is loss of reaction to light and preservation of reaction to accommodation (Argylle Robertson, pupil). Diplopia or double vision may occur, owing to paralysis of a muscle of one eye; it often comes on very suddenly, lasts a variable time, and may pass away to recur again. I have seen it occur and pass away again four separate times in one case. The ophthalmoscope may show atrophy of the optic nerves. Slowness in micturition occurs very frequently; sometimes there is slight dribbling of the urine.

Ataxia. Persons find it difficult to stand or walk in the k; they sway and stagger about, and this difficulty is ined if they cannot see where they are to put the feet; or ey have to walk on a narrow space or through a narrow

FIG. 16.



Showing the muscular atrophy contractures and deformities in a case of locomotor ataxia. (Drawn from a photograph by Dr. Duryea.)

doorway, or turn about quickly. This uncertainty is very much increased by making them walk with the eyes shut. If they stand with the eyes shut, they reel about from side to side, and are in danger of falling (Romberg, symptom). They are unable to touch accurately and directly objects with the feet or hands, if all extremities are involved in the disease; especially if the eyes are shut. Attacks of vomiting, "gastric crises," may occur, coming on suddenly, lasting a few hours, or a few days, and ceasing suddenly. There may also be nephritic crises simulating very closely nephritic colic; intense pain in the region of the kidney, with bloody urine; it ceases suddenly. They may also suffer what have been called "intestinal crises;" sudden attacks of looseness of the bowels; a kind of serous diarrhœa, which also ceases suddenly. Laryngeal crises are also observed; sudden coughing seizures, with great difficulty in breathing; the face distressed and turgid; and the person appears in imminent danger of dying; it suddenly ceases. The suddenness of onset and of disappearance characterizes all these "crises." There may be permanent paralysis in one or more of the eye-muscles, and ptosis (paralysis of the levator palpebræ, so that the lid droops over the eyeball) may occur in one or both eyes. Paralysis of the anterior tibial group of muscles in one leg may occur; may be passing or permanent. Muscular atrophy may occur in association with this disease, and it is usual in the lower extremities, but may also involve the upper; it may become extreme and give rise to contractures and deformities of the feet.

Apoplectiform seizures may occur in which the person is dazed, confused, and has difficulty in speaking; this is of temporary duration; it may be associated with hemiparesis (partial paralysis of one side of the body), or there may be a hemiparetic attack without the apoplectiform state. These hemiparetic attacks last a few hours or a few days, and pass away entirely. As trophic disorders, we may have arthropathic disease of some of the large joints; it becomes swollen without much redness; it is very much distended, and œdematous-looking. There is usually very little or no pain, as this subsides; dislocation may be discovered. Sometimes the joint remains permanently dis-

tended, but the eroded and absorbed heads of the bones can be felt, as in the subject of the accompanying illustration.

FIG. 17.



Showing arthropathie of the knee-joint in a case of locomotor ataxia, from the wards of St. Catharine's Hospital. (Drawn from a photograph by Dr. Slee.)

This man can throw his leg about without the least pain. These bones are found to have undergone extensive disease and absorption of their ends ; there may be evidences of an effort at repair.

The hip, knee, ankle, elbow, and shoulder are most frequently affected. Changes may take place in the long bones, so that they become very brittle, and spontaneous fractures may occur. These conditions are not very common. What has been called perforating ulcer of the foot may occur ; it is usually in the great toe. Black and blue spots may occur under the skin or nails at

the seat of severe lancinating pains, or without; they are due to small hemorrhages.

Deafness is observed in a few cases. In one case noticed by me there was complete loss of nerve conduction, as shown by the tuning-fork.

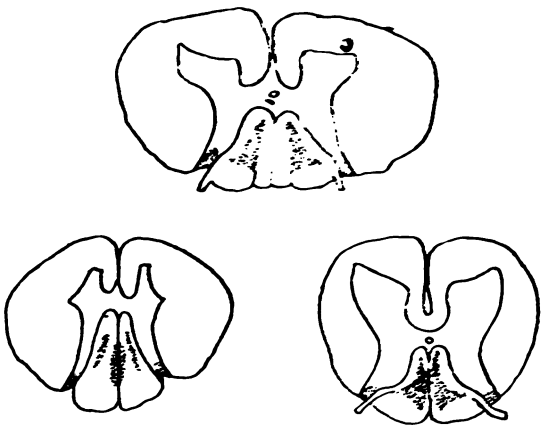
In a comparatively few cases mental symptoms occur; the memory becomes enfeebled; all the mental faculties are impaired; dementia. There may be some passing grandiose ideas, such as are found in general paralysis of the insane, but they are not usual; some passing delusions of persecution are more common; epileptiform seizures occur at this stage, and persons are liable to die in one of them. The duration of the disease is very variable. A great many persons will live ten or twelve years with it, and even longer; others, and these are the exceptional cases, die in two or three years from convulsions; a rapid progress of the disease or a diffuse myelitis is set up, running a somewhat rapid course; or the person may die of some intercurrent disease, of which Bright's disease is the most common.

Pathology. It has for some time been known that the anatomical lesion in this disease is in the posterior part of the cord. In recent years careful pathological studies by Pierret, Westphal, Strümpell, Lissauer, Flechsig, Raymond, and others—and the embryological studies of Flechsig and Betcherew, with the aid of improved technical methods, staining agents, etc.—have added much to our information of the pathological processes and their distribution, and have shown that the changes and the location of the lesion are not so simple as were heretofore believed. In an examination of sections from the spinal cord in an advanced stage of the disease, the entire posterior columns in the fresh state will be found to present a grayish look. In hardened and mounted sections these columns may be found diseased in their entirety; but a study of a series of cases, the subjects of which have died early in the course of the disease, has shown that there is a pretty uniform localization of the beginning lesion in the column of Burdach.

Autopsies made at various periods of the disease have shown that, later, other parts are involved, but that there is no uniformity in the succession of the parts subsequently diseased. The entire

column of Burdach becomes diseased: the columns of Goll; the posterior roots and nerves: the zones of Lissauer; Clark's columns may be found diseased in some cases; the direct cerebellar tract. The cells in the posterior horns may be atrophied,

Fig. 18.

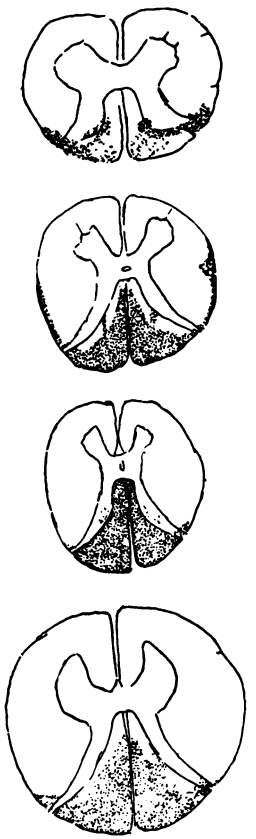


Showing the location of the beginning lesion.

and occasionally Gower's column is found degenerated. Many of these changes are, of course, secondary, notably the disease in Goll's columns, the cerebellar tract, and Gower's columns; they are of the nature of secondary degenerations.

Histologically, the changes in the posterior columns which have been called "Sclerosis" are really of the nature of a degenerative process; they are characterized by a gradual disappearance of the nerve-tubes, sometimes evidences of irritation in the vessels and neuroglia, but no active process as a rule. There is a small amount of granular material scattered among the diseased tissue; occasionally large numbers of amyloid bodies. In advanced cases where the nerve-fibres have largely disappeared, there is retraction of the neuroglia tissue, and the posterior column looks smaller and flattened; some posterior spinal meningitis may be observed, but it is not always present. The posterior

Fig. 19.



Davis. Well-marked case of Locomotor Ataxia, with severe lancinating pains. Shaded region shows diseased area.

roots are atrophied. The disease begins in the dorsal region usually, and there may be atrophy of the cells in Clark's columns, and to some extent of those in the posterior horns. The extent and exact distribution of the lesions vary very much in different cases after the early stages. Changes have been found in the peripheral nerves. But these are probably only present in the more advanced stages of the disease. These changes consist in breaking up of the myeline into irregular masses, which are scattered about the sheath of Schwann; there appears to be a tendency for this process of disintegration in the myeline to begin in the neighborhood of the constriction of Ranvier. There is a resistance of the axis cylinder to this disease process for a long time; it can be found sharply stained by carmine in the sheath, with very little myeline left. There is no increase in the size of the nuclei such as is seen after degeneration of the nerve from section. These changes in the nerve are most marked at its terminal ends, but it is also found extensively in the trunks.

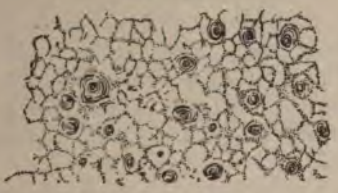
Diagnosis. Lancinating pains, ataxia, pupillary changes (described above), absent tendon reflex, are sufficient to make the diagnosis.

Prognosis. Unfavorable as to recovery; it is slowly progressive.

Treatment. Iodide of potassa in some cases appears to improve

the condition, but it never cures, even those cases which have a clear syphilitic history. As internal remedies, perhaps Donovan's solution is as good as any. If the physicial condition is poor, nutritious, easily digestible food with cod-liver oil.

Fig. 20.



Advanced disease of the posterior column, nerve-fibres in all stages of degeneration. There are very few fibres left.

For the relief of symptoms, the lancinating pains are the most troublesome. Antifebrin in 10-grain doses when the pains begin will often give relief (phenacetin and antipyrine are not nearly so efficacious); it should not be repeated too frequently. There are cases in which this dose will fail to give relief; in fact, any dose which is safe,—and nothing but a hypodermic of morphia will allay the excruciating pains. Very recently suspension with Sayre's apparatus (for putting on the plaster-jacket) and modifications have been used; in some cases it gives relief to many of the symptoms—among them, the pain, ataxia, and bladder symptoms; in others it does not appear to be at all beneficial. In making application of the suspension apparatus, care should be taken to learn if there are contraindications to its use: heart disease, serious disease of the bloodvessels, or great weakness are the chief ones. The suspension should be made very slowly and cautiously. On the least evidence of ill effect, the person should be lowered. It should not be continued more than half a minute the first time, and gradually increased to two or three minutes if it is borne well; it can be practised every other day. Belladonna often gives relief to the dribbling and involuntary discharge of urine. Overwork of all kinds, sexual and alcoholic excesses should be carefully avoided. Only a moderate amount

of walking should be done. Cold and damp should be avoided. A residence, temporarily at least in a dry elevated climate, with freedom from work and worry, often gives rise to improvement.

Bibliography.—The various works on Nervous Diseases.—E. C. Seguin, American Clinical Lectures, 1878, Opera Minora, 1884.—J. C. Shaw, Transactions Kings County Medical Society, 1879.—Buzzard, Lectures on Diseases of the Nervous System, 1882.—Hale White, Brain, 1886.—J. C. Shaw, Apoplectiform, Epileptiform, and Hemiparetic Attacks in Locomotor Ataxia, N. Y. Med. Journal, 1888.—J. C. Shaw, Degeneration of the Peripheral Nerves in Locomotor Ataxia; Journal Nervous and Mental Dis., 1888.

The literature on Locomotor Ataxia is enormous. Additional references will be found in the articles referred to and in special journals.

Friedreich's Disease.

(Hereditary Ataxia; Postero-Lateral Spinal Sclerosis of Generic Origin, Dr. Everett Smith.)

This disease was first discribed by Friedreich in 1861. It develops in children at any early age, as the result probably of hereditary influences, and it usually affects several children in the same family; but isolated cases are not unfrequent. It occasionally develops as the individual grows up. There may be a neurotic family history; the sexes are about equally affected.

Symptoms. It is first shown by an unsteadiness in walking; the child is awkward, falls easily and frequently; as the disease advances the upper extremities are affected; they become like the legs; the person's movements are disorderly.

This increases; soon difficulty in speech is observed; it is slow and hesitating, and can become quite unintelligible, owing to the disorderly movement of the muscles. In one case which I have observed for years the symptoms began at 11 years of age and have gradually increased until the difficulty in speech is so great it is almost impossible to understand her; the ataxic symptoms have become so great she cannot walk without sup-

port, and the motions are then the most disorderly possible, in both arms and legs, for in attempting to walk she also puts the arms in motion. She is now over 40 years old. Nystagmus is said to occur in some of these cases. The tendon reflex is lost

Fig. 21.



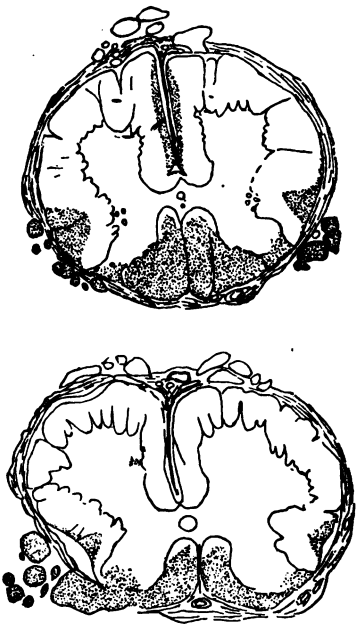
Showing the attitude and deformities of the feet. (Drawn from illustrations by Dr. W. E. Smith.)

in most of the cases, but it may be present and even exaggerated in some cases. Spinal curvatures may be present. There may be pains, but they are not lightning-like, but dull, and may be severe, located in one spot for a long time; as a rule, sensibility is normal, but there may be slight anæsthesia. Contractures may occur in the lower extremities. There are no pupillary changes.

Diagnosis. From locomotor ataxia, Friedreich's disease begins usually in very young children; only rarely the first symptoms appear at an age when locomotor ataxia is common; absence of lightning pains, of marked sensory symptoms, of bladder disturbances, of diplopia, and "crisis" of abdominal symptoms, constriction in hypogastric region, of arthropathies. The very slow evolution of Friedreich's disease.

From disseminated sclerosis with which it is most likely to be confounded. There is no tendency in disseminated sclerosis to occur in several members of a family ; the disordered movements are more jerky and slow, the disorder of speaking is different, more slow and drawling, hesitating than in Friedreich's disease, a tendency to convulsions in disseminated sclerosis, and the walk is spastic.

FIG. 22.

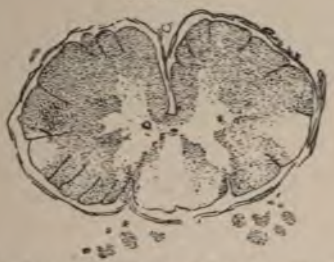


Showing the changes in the posterior and lateral columns (shaded regions) of the spinal cord. (Drawn from illustrations by Dr. W. E. Smith, Boston Medical and Surgical Journal, 1885.)

Pathological Anatomy. It has been found that the spinal cord is smaller than the normal in all these cases. There appears to be a defect in its development. The result is that sooner or later it undergoes a premature pathological process, and this

takes place in the posterior and lateral columns. The extent to which these columns have been found diseased varies somewhat, as the accompanying illustrations will indicate.

FIG. 23.



Section of the spinal cord in a case of Friedreich's disease, posterior and lateral columns diseased (unshaded portions show diseased area). Diseased areas, Gower's column (?); pyramidal bundles; direct cerebellar bundles; columns of Burdach; columns of Goll; columns of Clark. Band of healthy tissue around the posterior horn, central canal, and external zones of Lissauer healthy. (Drawn from an illustration by Blocq and Marinesceo, Archiv de Neurologie, 1890.)

Histologically, some authors have described posterior spinal meningitis, but in the majority of these cases it has not been found; the gray degeneration of the posterior columns has been constant, atrophy, and disappearance of the nerve fibres, with some thickening of the neuroglia, flattening of the cord from before backward. Degeneration of Clark's columns and of the cerebellar tract and atrophy of the posterior roots have been found.

Bibliography.—W. A. Hammond, Journal Nervous and Mental Disease, 1882.—Dr. W. Everett Smith, Boston Medical and Surgical Journal, 1885.—E. C. Seguin, N. Y. Medical Record, 1885.—Sinkler, Medical News, Phila., 1885.—Morton Prince, Boston Medical and Surgical Journal, 1885.—Judson Bury, Brain, 1886.—C. L. Dana, N. Y. Medical Record, 1887.—Ormerod, Brain, 1888.—J. F. C. Griffith, American Journal Medical Sciences, 1888.—W. Everett Smith, Boston Medical and Surgical Journal, 1888.—Ladam, Brain, 1890.

Combined Sclerosis.

(Ataxic Paraplegia.)

Under the general designation of combined sclerosis have been classed a number of conditions whose symptomatology and even pathological anatomy are not fully made out.

Friedreich's disease and ataxic paraplegia are types as far as the pathological anatomy are concerned.

Ataxic Paraplegia.

Etiology. Heredity, syphilis, excessive physical labor, exposure, alcoholic and venereal excesses; it occurs also in elderly persons who have been subject to much privation and anxiety.

Symptoms. It begins usually very slowly, by stiffness and trembling in the lower extremities, with soreness and aching. Early the sexual vigor is lost; there is gradually developed marked motor weakness; there may be a feeling of numbness in the legs; and occasionally lightning-like pains are present, but they are not, as a rule.

FIG. 24.



Ataxic paraplegia. Shaded regions indicate the disease in the white matter. (Drawn from an illustration by Dr. Clark, Brain, 1890.)

Ataxia is always present, as shown by inco-ordinate movements in walking or standing with eyes shut, etc. The gait is a mixture of locomotor ataxia and spastic paralysis. There may be dribbling or slowness of urination. The reflexes are exaggerated. The symptoms are often confined to the lower extremities, but

the upper may be affected. As complications there may be mental disease somewhat similar to that observed in locomotor ataxia.

Pathological Anatomy. The lesion is a sclerosis of the lateral and posterior columns somewhat similar in distribution and histologic changes to that found in Friedreich's disease. The accompanying illustrations will show the distribution of the lesion.

Diagnosis. The slow progress of the disease, the association of ataxia, paresis, exaggerated reflexes.

Prognosis. It is a slowly progressive disease; there is slight tendency for it to cause death.

Treatment. Must be the same as recommended in locomotor ataxia, Friedreich's disease, etc.

Bibliography.—Ormerod, Brain, 1885.—Dana, New York Medical Record, 1886, and Brain, 1889.—J. J. Putnam, Journal Nervous and Mental Disease, 1891.—J. Mitchell Clark, Brain, 1890.—Grasset, Archiv de Neurol., 1886.

CHAPTER III.

Muscular Dystrophies.

THIS is the name given to a class of muscular atrophies which are quite evidently not of nervous origin, but are in the muscles themselves. Pseudo-hypertrophic muscular atrophy, the oldest known of this group, has always been considered among diseases of the nervous system, probably because of its resemblance to the group of myelopathic muscular atrophies and the suspicion that it also was due to some nerve changes.

Pseudo-Hypertrophic Paralysis.

(Muscular Pseudo-Hypertrophy.)

Etiology. Males are oftenest affected; it occurs very often in several members of a family, but individual cases are also met

with. In many cases there is no history of the ancestors having been affected. In other instances there is an hereditary transmission, and it is always through the mother, but who is not the subject of the disease herself. It has been observed that the children of a woman by different husbands have been affected. It always begins very early in life ; it may be first observed when the child begins to walk.

Symptoms. Impairment of muscular power as shown by difficulty and awkwardness in motion, often falls; finds difficulty in going up a stairs, takes hold of the banister to pull himself up by; the muscles may present nothing unusual; later an enlargement of some of the muscles may be observed, and this is most frequently in the calf muscles; this may be made more apparent by atrophy of the thigh muscles. The extensors of the knee, the gluteal and lumbar muscles are often enlarged, and the infra spinatus (Gowers). The lower border of the pectoralis and latissimus dorsi are often wasted; the muscles of the forearm are only affected in a small proportion of the cases. The weakened muscles cause difficulties and peculiarities in movement, the walk is swaying from side to side, there is marked lordosis in some cases, there is marked difficulty in raising from the floor or from a seat or going up a step where there is no rail to hold on to; one hand is placed on the knee and the body is pushed up. The shortening and contracture which may occur in some of the muscles give rise to abnormal positions of the body and extremities; there may be contracture of the calf muscles so that the heel cannot be brought to the ground. A few years ago I was consulted by a young lady, aged 22, because of an inability to put the heel of one foot to the ground. She had no other symptoms and presented every appearance of being in good health; examination showed that the calf muscles on that leg were double the size of the other. She said this enlargement had existed as long as she could remember, and she had only in the past six months experienced this difficulty in putting the heel on the ground; there was no hypertrophy or atrophy any where else; she could go up and down stairs without any difficulty. Curvature of the spine may occur as the result of muscular weakness. There may be

diminution of electrical reaction, but no degenerative reaction. The tendon reflex is at first normal, but as the extensors of the knee atrophy it is lost.

FIG. 23.



Showing the muscular wasting in the gluteal and thigh muscles; hypertrophy (pseudo) of the calf muscles; contracture in gastrocnemius on one side, so that the heel cannot be brought to the floor, not well shown in the photograph. Lordosis. (Drawn from a photograph by Dr. Slee.)

Pathological Anatomy. Atrophy of the muscles, absence and wasting of the fibres, the presence of large quantities of fat and connective tissue, the motor nerves have not been found diseased, and the spinal cord is normal. It is evidently a congenital defect in the construction and vitality of the muscle, so that it prematurely undergoes atrophic changes.

Diagnosis. The age, the muscular hypertrophy in certain

muscles, and atrophy in others; the peculiar gait and mode of rising, etc.

Prognosis. Not favorable; if the disease develops late, it is possible it may progress very slowly.

Treatment. No treatment has been found beneficial. Gowers believes that muscular exercise has some influence in retarding the progress of the disease; massage and electricity may be of some service; if contractures occur, tenotomy may be resorted to for the relief of the deformities.

In the last decade there has been much activity in describing and dividing up into types, with special names, some of these muscular dystrophies. These divisions are evidently artificial, in spite of their apparent individuality, and are most probably variations in the group of muscles first attacked, in its mode of progress, etc.

Erb's Juvenile Atrophy. In 1884 (second article) Erb described a muscular wasting, which has since been known under the above designation. It occurs in children or youth as a weakness and atrophy of the muscles of the shoulder, upper arm, and pectoral region, thigh and back; the forearm and leg muscles are said not to be affected for a long time. The atrophy may be associated with true or pseudo-hypertrophy of some muscles. Fibrillary contractions and reaction of degeneration are said never to be present. There are no sensory or vesical disorders. The wasting is in the pectorals, trapezius, latissimus dorsi, serratus, and rhomboids, as well as most of the upper arm muscles, while the deltoids, supra- and infra-spinatus are either hypertrophied or normal for a long time.

More recently a variety has been described by Landouzy and Dejerine—the Landouzy-Dejerine or fascio-scapulo-humeral type. It begins, as a rule, in early life, and in the muscles of the face, and gives rise to a characteristic thickening of the lips, which they have described as tapir mouth; later the atrophy affects the muscles of the shoulder and arms, supra- and infra-spinatus, subscapularis; flexors of the hand and fingers remain normal; exceptionally it may begin in the muscles of the shoulder and arm, or even in the lower extremities. It is distinctly

hereditary; fibrillary contraction and reaction of degeneration are never present.

A variety has been described by Leyden as hereditary progressive muscular atrophy.

Heredity is the prominent cause in all these cases. It begins gradually as a weakness and wasting in muscles or muscular groups at an early period of life. The tongue, muscles of mastication, and pharynx are never affected. The electrical irritability may be diminished, but there is no reaction of degeneration. Some shortening of the muscles has been observed, especially the calf muscles; deformities may occur as in progressive muscular atrophy. Its course and duration are variable; it may remain confined to one part or extend to others.

Bibliography.—B. Sachs, New York Medical Journal, 1888, where a full list of references will be found.

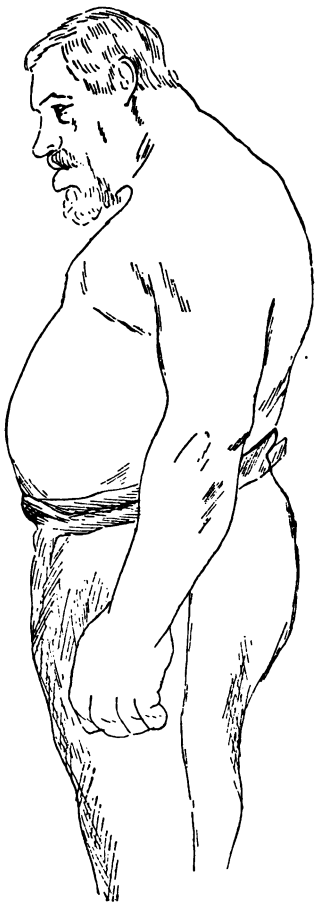
Acromegaly.

In 1886 Pierre Marie first gave a description of this disease from a study of two cases in the wards of Prof. Charcot. Since then contributions have been made to the subject by Marie and others. A summarized account of the condition only will be given here from Marie's articles.

It is characterized by a truly remarkable hypertrophy of the extremities, hands, feet, and head. The hands are enormous, their form is regular, but width out of proportion to their length; the fingers present a "sausage-shaped" form; there is often swelling of the articulations of the first and second phalanges, with a certain flattening of the fingers in the anteroposterior direction. The palmar lines are exceedingly marked and bordered by enormous folds. The hypertrophy affects not only the skeleton, but to a marked degree the soft parts; it is especially developed at the upper part of the hand and its ulnar border. The nails are flattened, rather widened, and their lateral borders are sometimes curved up. The feet are enormous; on their external border the mass of tissue forms an enormous pad.

The malleoli are generally increased in size; to a less degree the head of the fibula and the upper extremity of the tibia; otherwise the size of the legs is not much increased. The knees often appear prominent, owing to increase in size of the patella and condyles of the femur. Diameter of the thigh unchanged. The cephalic extremity is increased in size; especially marked in the prominent parts of the face. The cranium is but little altered in shape and size; the face appears elongated vertically; forehead usually rather low, with marked prominence of orbital arches (due especially to dilatation of the frontal sinuses). The eyelids are often elongated; thickened; their tarsal cartilages may be hypertrophied. The nose is increased in all its dimensions, it is enormous; the cheeks generally flattened and elongated; the cheek bones prominent and bulky. The increase in the size of the lower lip contributes greatly to give the patient the remarkable physiognomy which makes him recognizable at a distance and at a glance. The lip is prominent and strongly everted. The upper lip may be a little thickened, but not comparable to the lower. The chin projects markedly downwards and forwards, it is large and massive; the lower

Fig. 26.



Acromegaly. (Drawn from an illustration by Marie.)

jaw is increased in size, and as the upper jaw does not undergo the same modifications a very marked degree of prognathism often ensues. The tongue is of enormous dimensions, and in some cases double its normal size ; its shape remains perfectly

FIG. 27.



Showing the shape and size of the hands in Acromegaly. (Drawn from an illustration by Marie.)

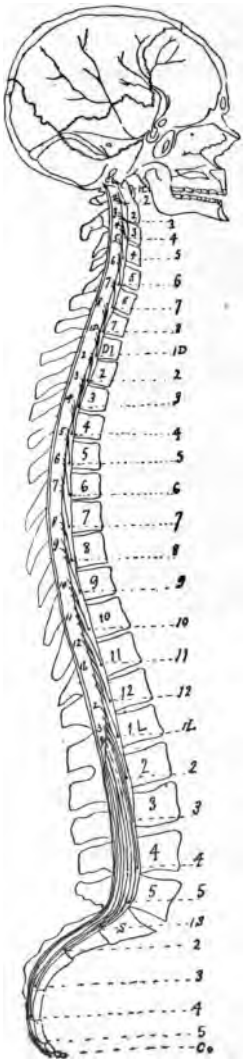
regular ; its increase is in all directions. These modifications of the tongue and lips sometimes interfere with articulation. The ears are sometimes increased in size. There is a marked kyphosis in the upper part of the dorsal region ; the patient's head is buried in his shoulders in consequence. The vertebræ are very much hypertrophied. The neck is short and thick. There is an enormous increase in the thorax. Headache is present, and pains in joints in a certain number of cases. There are no mental disturbances.

Bibliography.—Marie, Rev. de Médecine, 1886 ; Le Progrès Médical, 1889 ; Brain, 1889.—Adler, Medicinische Monatschrift, N. Y., 1890.—Ross, International Clinics, 1891.

Localization of Lesions in the Spinal Cord.

Only a few words can be said here on this subject. The student must refer to the works on physiology, and with the aid of the accompanying table from Starr and the diagram of the spinal segments and their nerves, in relation to the vertebra, he will have ample material for study and locating lesions in the cord. This study is of importance, as in injuries of the

Fig. 28.



Spinal cord. (After Gowers.)

cord by fracture, tumor, etc., the possibility of surgical interference as a means of relief must be considered; and it is necessary to locate the lesion.

Lesions of the cauda equina give rise to paralysis, anæsthesia, atrophy of muscles, and reaction of degeneration in the distribution of the sciatic nerve; the sphincter ani is paralyzed, while the bladder may remain normal. Lesions of the lower lumbar enlargement give rise to the same symptoms.

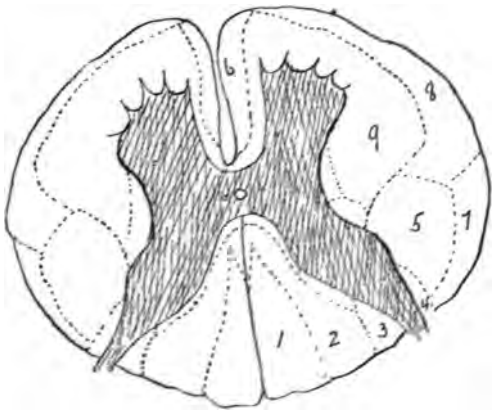
Lesions of the upper and mid-lumbar cord cause paraplegia without paralysis of the abdominal muscles. The paralyzed muscles retain their normal electrical reactions, and the reflexes are increased. The sphincter is usually paralyzed. Lesions of the dorsal cord cause paralysis and anæsthesia of all parts below the lesion. The line of anæsthesia indicates the seat of lesion; the sphincters are paralyzed and reflexes exaggerated.

Lesions at last cervical and first dorsal; paralysis in the ulnar distribution and anæsthesia of the lower forearm, ulnar side of hand and fingers; paralysis of flexor carpi ulnaris, etc. Paralysis of intercostal muscles; the line of body anæsthesia just below clavicle.

A reference to the table and diagram will make this plain. Para-

lysis may be caused by a lesion in the anterior horn of the spinal cord; the muscles atrophy, and their electrical reactions are changed, and the reflexes are lost, for those muscles innervated by that diseased spinal segment. If the paralysis is due to an interference with the transmission of voluntary motor impulses, through the pyramidal tract, as in paralysis from brain disease, the muscles do not atrophy; the reflexes are exaggerated; the tonicity of the muscles is increased, and there may be rigidity; the normal electrical reactions are preserved. Loss of reflex indicates a lesion which interferes some-

FIG. 29.



1. Column of Goll. 2. Column of Burdach. 3. Internal marginal zone of Lissauer. 4. External marginal zone of Lissauer. 5. Crossed pyramidal tract. 6. Direct pyramidal tract. 7. Direct cerebellar tract. 8. Gowers' tract. 9. Deep portion of lateral column.

where with the reflex arc for that spinal segment. Normal reflex indicates that the arc is intact; exaggerated reflex that the inhibitory action of the brain is removed, and always indicates a cutting off (or irritation) of the pyramidal tract from the brain somewhere in its course; the reflex is exaggerated below the focus of disease.

Localization of the functions of the segments of the spinal cord. (*Starr.*)

SEGMENT.	MUSCLES.	REFLEX.	SENSATION.
2d and 3d cervical	Sterno-mastoid, trapezius, scaleni and neck, diaphragm.	Hypochondrium(?); sudden inspiration produced by sudden pressure beneath the lower border of ribs.	Back of head to vertex; neck.
4th cervical	Diaphragm, deltoid, biceps, coraco-brachialis, supinator longus, rhomboid, supra- and infra-spinatus.	Pupil, 4th to 7th cervical; dilatation of the pupil produced by irritation of the neck.	Neck, upper shoulder, outer arm.
5th cervical	Deltoid, biceps, coraco-brachialis, brachialis anticus, supinator longus, supinator brevis, rhomboid, teres minor, pectoralis, serratus magnus.	Scapular, 5th cervical to 1st dorsal; irritation of the skin over scapula produces contraction of the scapula muscles, supinator longus; tapping its tendon in wrist produces flexion of forearm.	Back of shoulder and arm; outer side of arm and forearm, front and back.
6th cervical	Biceps, brachialis anticus, pectoralis (clavicular part), serratus magnus, triceps, extensors of wrist and fingers, pronators.	Triceps, 5th to 6th cervical; tapping elbow tendon produces extension of forearm; posterior wrist, 6th to 8th cervical; tapping tendon causes extension of hand.	Outer side of forearm, front and back; outer half of hand.
7th cervical	Triceps (long head), extensors of wrist and fingers, pronators of wrist, flexors of wrist, subscapular, pectoralis (costal part), latissimus dorsi, teres major.	Anterior wrist, 7th to 8th cervical; tapping anterior tendons causes flexion of wrist; palmar, 7th cervical to first dorsal; striking palm causes closure of fingers.	Inner side of back of arm and forearm; radial half of hand.
8th cervical	Flexors of wrist and fingers, intrinsic muscles of hand.	— —	Forearm and hand, inner half.
1st dorsal	Extensors of thumb, intrinsic hand muscles, thenar and hypothenar eminences.	— —	Forearm, inner half; ulnar distribution to hand.
2d to 12th dorsal	Muscles of back and abdomen, erectores spinæ.	Epigastric, 4th to 7th dorsal; tickling mammary region causes retraction of the epigastrium; abdominal, 7th to 11th dorsal; striking side of abdomen causes retraction of belly.	Skin of chest and abdomen in bands running around and downwards corresponding to spinal nerves; upper gluteal region.

Segment.	Muscles.	Reflex.	Sensation.
1st lumbar	Ilio-psoas, sartorius muscles of abdomen.	Cremasteric, 1st to 3d lumbar; striking inner thigh causes retraction of scrotum.	Skin over groin and front of scrotum.
2d lumbar	Ilio-psoas, sartorius, flexors of knee (Remak), quadriceps, femoris.	Patella tendon; striking tendon causes extension of leg.	Outer side of thigh.
3d lumbar	Quadriceps, femoris, inner rotators of thigh, abductors of thigh.	—— ——	Front and inner side of thigh.
4th lumbar	Abductors of thigh, adductors of thigh, flexors of knee (Ferrier), tibialis anticus.	Gluteal, 4th and 5th lumbar; striking buttock causes dimpling in fold of buttock.	Inner side of thigh and leg to ankle; inner side of foot.
5th lumbar	Outward rotators of thigh, flexors of knee (Ferrier), flexors of ankle, extensors of toes.	—— ——	Back of thigh, back of leg, and outer part of foot.
1st and 2d sacral	Flexors of ankle, long flexors of toes, peronei, intrinsic muscles of foot.	Plantar; tickling sole of foot causes flexion of toes and retraction of leg.	Back of thigh, leg, and foot, outer side.
3d to 5th sacral	Perineal muscles.	Foot reflex, Achilles tendon; over extension of foot causes rapid flexion, ankle clonus, bladder and rectal centres.	Skin over scrotum, anus, perineum, genitals.

For further information on this subject the student can refer to Thorburn, The Surgery of the Spinal Cord.—Seguin, Pepper's System of Medicine.—Starr, Chapters on Localization of Spinal Cord Diseases, Familiar Forms of Nervous Disease.

SECTION III.

DISEASES OF THE BRAIN.

Acute Meningitis.

(Leptomeningitis Infantum.)

It is by no means confined strictly to the convexity; it occurs mostly in children, but may affect adults; its exciting causes are not well known. Injuries are assigned in some cases.

Symptoms. It often begins suddenly, but there may be premonitory symptoms: Headache, followed by chill, with rise in temperature and increased pulse-rate; in young children there may be convulsions or convulsive twitchings in the muscles of the face or extremities; vomiting and nausea is a frequent symptom; delirium may occur. The child lies in a dull drowsy condition, with distressed facial expression; is irritable; does not like to be disturbed; photophobia is almost constant. If the base of the brain becomes involved, there is strabismus, which at first may be passing, and later permanent. Changes in the pupils are constant; rigidity in the back of the neck; later, the stupor gives rise to coma. There may be retraction of the abdomen, and paroxysms of screaming; as the disturbances of nutrition increase, by reason of the pressure from hydrocephalic fluid, and the disturbances in the vessels; the respiration becomes labored, and assumes the character of Cheyne-Stokes; the coma deepens, and death occurs quietly or with a convulsion.

Meningitis Purulent.

(Leptomeningitis with Pus.)

This is also at times called meningitis of the convexity, but is frequently generalized, and even begins as a basilar meningitis.

Etiology. In many cases it is very difficult to assign a cause; it occurs at all ages, in infants, young persons, and in adults; men are most liable to it. It occurs secondary to purulent inflammation of the middle ear with bone disease. From injuries to the bones of the skull; after erysipelas, pneumonia, etc.; from disease of the parts about the nose, eyes, and head.

Symptoms. It is generally sudden in its onset; a chill, fever, irregular in type; severe headache; delirium; vomiting may occur; the pain may be referred to any part of the head; light and noise are distressing; there may be disturbances of speech; aphasia; the headache may be intense, and in children give rise to screams; strabismus, sluggish or fixed pupils; muscular twitchings may occur; there may be paralysis if large accumulations of pus occur in the motor areas so as to cause pressure; in children there may be grinding of the teeth and trismus; the mode of death is the same as in the other varieties of meningitis.

Pathological Anatomy. In purulent leptomeningitis the meshes of the pia are filled with pus, especially along the vessels; the process may be most intense at the convexity or base if it is the result of middle ear disease; the pus from the ear often finds its way along the fifth or the auditory nerve, and consequently the base of the brain is first and most extensively affected. In leptomeningitis infantum there are often no definite changes discoverable after death except the presence of exuded white corpuscles, anæmia, light œdema; this may be the result of the rapidly fatal termination in some cases.

Prognosis is unfavorable in all these cases.

Treatment. At present treatment gives no favorable results. Morphia to relieve the pain is indicated.

Meningitis Tubercular.

Etiology. The tubercular diathesis and a neuropathic constitution; it occurs among the rich as well as the poor; it is most frequent between the ages of 2 and 10 years; males are more frequently affected.

Symptoms. As premonitory symptoms, general indisposition, slight headache, loss of appetite and flesh, constipation, etc.;

this may exist for weeks before pronounced symptoms appear. The symptoms vary very much in different cases: there may be a chill; severe headache; photophobia; a rise of temperature; vomiting may occur; indisposition to move; there may be spasmodic twitchings in the muscles of the face or extremities; there soon occur lancinating pains in the head, during which the child screams or shrieks out, or moans and tosses about. The pupils may show no change at first, but soon there are inequalities and sluggishness in the light reactions with spontaneous oscillations; later, they are fixed; there is now passing paresis of some eye muscles, so that there is, at times, strabismus; later, it is constant. There are now retraction of the head and rigidity of the muscles of the neck; the face is dusky, and there is stupor from which the child is with difficulty aroused. The abdomen may or may not be retracted; light and noise become more and more intolerable; the temperature may run high. There may be delirium, but it is not common. Optic neuritis may be found. As the disease progresses convulsions may occur; and later, coma and difficult respiration with frequent irregular and weak pulse close the scene.

Prognosis. Unfavorable.

Pathological Anatomy. The pia is studded more or less thickly with tubercular nodules, especially over the base; they surround the bloodvessels of the pia and even those entering the brain; there is some slight œdema with fibro-purulent deposit. The internal hydrocephalus which is present explains, in part, some of the symptoms.

Chronic Hydrocephalus.

(Internal.)

Etiology. Is not clear. Hereditary predisposition appears to play some part; congenital syphilis is believed to have a causative influence; several children born in the same family may be hydrocephalic; traumatism to the mother may play a part in causing it. Bad hygienic conditions. It may be caused by tumors of the cerebellum and its vicinity pressing on the vena

galeni. It usually begins just before or soon after birth; it may be preceded by an acute attack.

Symptoms. Convulsions, rolling of the eyes about and crying, are often observed just after birth; later the head is observed to be growing larger; but frequently no special symptoms are observed until the child is several months old, when the head is found to be growing out of proportion to the body; the fontanelles remain unclosed, and the child begins to have a peculiar way of rolling the eyes about. Fluid gradually increases in the ventricles, widening the skull at all parts; the frontal bones push forward, and the head sometimes becomes enormous. The child is dull and stupid, and as the pressure becomes greater the optic nerves may be so injured that sight is much impaired, or lost. The disease is almost always fatal, but the child may live a long time. When it remains slight and its progress is arrested, it is not incompatible with great mental power.

Cerebral Hemorrhage.

Etiology. Some persons appear predisposed; the disease occurs usually after 40 years of age; it is more frequent in men; anything which tends to produce degeneration and disease of the cerebral arteries predisposes to it. Disease of the cerebral arteries is the prime cause. Under these circumstances any great increase in the arterial tension may cause rupture of the vessel.

Symptoms. The attack is frequently ushered in without any warning; in other cases there are premonitory symptoms: dizziness, headache, numbness in the extremities on one side, mistakes in talking or writing, irritability. In the simplest attack the person suddenly falls, or rather slowly drops down, is confused, but may not lose consciousness; or if he does, it is only momentary, there is more or less paralysis on one side. In the more severe attack he loses consciousness, falls, breathes heavily; face is flushed, dusky, and swollen, profuse perspiration breaks out all over the body; the respiration becomes puffy; the arteries throb; the conjunctiva is injected; the lids closed; the person lies in a heap, as it were. If the extremities are picked up, it will be found that they drop heavily when let go,

but much more so on one side than on the other—the paralyzed side. Immediately after the attack, the temperature is lowered, and in cases which die in a few hours it remains low. If death does not take place soon, there is a rise in the temperature, and if the condition does not progress favorably the temperature keeps rising until it may reach 106° or 108° F. before death. In the cases which progress favorably the elevation in temperature subsides in oscillations to the normal. There is in all cases of severe hemorrhage a turning of the eyes and head (conjugate deviation) to the side of lesion and away from the paralyzed side. If recovery from the immediate symptoms occurs the person is found paralyzed on one side—arm, leg, and lower facial muscles —Hemiplegia. If the hemorrhage occurs so as to injure the sensory tract in the posterior part of the internal capsule, there will be either permanent or passing hemianæsthesia.

If the paralysis is on the right side, there may be aphasia. After a short time the person may be able to walk about; the paralyzed extremities become stiff (early rigidity), the joints are swollen and painful, the circulation is impaired; this early rigidity gives place to a certain amount of contracture (late rigidity). The reflexes on that side are exaggerated. No muscular wasting takes place; and the electrical reactions are not changed. Very exceptionally an acute muscular wasting may occur; I have met one case of the kind; it is due to a secondary lesion in the anterior horns of the spinal cord. It occasionally happens that the onset of a cerebral hemorrhage is accompanied with convulsions; this is the case when the hemorrhage breaks into the ventricle or perforates the cortex, so that the blood is poured out into the base of the brain. Sufferers from cerebral hemorrhage rarely recover their former mental vigor; they are emotional, unable to do mental work, and in some cases there are marked mental enfeeblement and even dementia.

Pathological Anatomy. The greatest number of hemorrhages occur in the corpus striatum and its neighborhood. Charcot and Bouchard years ago pointed out that miliary aneurisms could be found in nearly all these cases; a form of periarteritis is the condition which leads to the formation of these aneurisms.

Atheromatous changes in the vessels may also lead to rupture. It is believed that primary fatty degeneration of the vessels is the cause of the rupture and hemorrhage in young persons. After the hemorrhage has destroyed the motor fibres in the internal capsule, a secondary degeneration downwards takes place in the anterior pyramid in the medulla; and in the direct and crossed pyramidal tract in the spinal end, this degeneration in the cord is associated with the contracture and the exaggerated reflexes.

Prognosis. Depends upon the extent of the hemorrhage; a study of the temperature will be found of service in all cases where the hemorrhage is at all extensive. Permanent hemiplegia is the result.

Treatment. The clothing should be loosened, and the head placed in an easy position. Dr. A. A. Smith has recently suggested depressing the head and raising the lower extremities and trunk, so as to cause rapid flow of blood to the brain, with the idea of rapid coagulation of extravasated blood, and closure of the vessel. He has also proposed lowering the arterial tension by the use of inhalations of nitrite of amyl, nitro-glycerine, by the mouth or hypodermically. Gelsemin and other vascular depressants can be used. This method of treatment is opposed by many good authorities. The contracture which occurs as a late symptom can best be ameliorated by massage and electricity.

Occlusion of Vessels.

(Embolic Closure. Thrombosis. Endarteritis. Thrombosis of Cerebral Sinuses.)

Etiology. Valvular disease of the heart, with fibrinous deposits, which may be washed off into the circulation; absorption of foreign material, like blood-clots, etc., from injuries of all kinds; portions of morbid growths, which may be detached and enter the circulation; disease of the bloodvessels, which narrows their calibre (endarteritis), or roughens the internal surface (atheroma), and gives rise to a tendency to the deposit of fibrin at this point; altered conditions of the blood as the

result of exhausting diarrhœa, and other wasting disease. Embolism is more common in the young; thrombosis and hemorrhage in the aged. Symptoms of embolic closure of an artery are very similar to those observed in cerebral hemorrhage; in fact, it is frequently impossible to make a differential diagnosis; the loss of consciousness is usually not as great in embolism, but as all degrees of loss of consciousness occur in cerebral hemorrhage, depending upon the extent of the hemorrhage and its location, this is not worth much as a differential point; the presence of decided valvular disease of the heart would be of more value, but even this does not make a positive differential diagnosis, as a rupture of a cerebral vessel is just as likely to occur in such a case. If the vessel plugged be large, such as the middle cerebral, which is the most commonly closed, and the left side most frequently, the area of subsequent softening is large, and we have the hemiplegia as found in cerebral hemorrhage.

Thrombosis. The symptoms are said to come on slowly, with many premonitory signs, and the paralysis is slowly progressive, not sudden as in hemorrhage and emboli. The paralysis is hemiplegic in type, and all the other symptoms found in cerebral hemorrhage are present.

Thrombosis of the cerebral sinuses occurs in children usually. The symptoms are indefinite; convulsions, headache, nausea, vomiting, spasmodic condition of various muscles of the eyes, face, and limbs are said to be present. This must be an exceedingly rare condition, and it is highly probable that some of the symptoms which have been attributed to thrombosis of the sinuses are due to anæmia from exhausting disease, or to an early stage of basilar meningitis.

Pathological Anatomy. Embolic plugs are formed either by fragments of fibrin washed off from the diseased valves of the heart or from fatty detrital masses from old blood extravasations after injuries which in the process of absorption enter the general circulation, or possibly from small detached portions of morbid growths in the large cavities of the body which encroach upon and open into a vessel, or from the deposit of fibrin in an aneurismal dilatation, or from broken-down athero-

matous patches. After the artery is plugged, softening of the cerebral tissue in the area of the arterial distribution occurs.

The same occurs in thrombosis and endarteritis.

Intracranial Tumors.

New growths may occur either in the cerebral substance itself, or external to it, in the intracranial cavity.

Etiology. Often there are no indications as to causation. In children they often develop during or very soon after attacks of eruptive fevers, measles, scarlet fever, etc., evidently as the result of some disturbance set up in the cerebral substance, its envelopes, or bloodvessels. They may develop secondary to tumors in other parts of the body; they are most apt to occur after tumors in the large cavities of the body; "secondary growths." Injuries are supposed to play a part in their development, and they may be the means of setting up the processes which give rise to the development of tubercular and syphilitic growths. Bramwell thinks they are more common in men than in women. Tubercular tumors are most common in children and young persons; syphilitic tumors in early and middle life. Sarcomatous tumors may also occur in young persons.

Symptoms. The general symptoms are headache, more or less severe, often not located; frequently referred to a part distant from the seat of growth; they are most often generalized. Tumors developing in the pia or dura are more apt to give rise to severe headache than those developing in the cerebral substance.

Vertigo occurs in almost all the cases, but it is transient; there may be associated with these vertiginous attacks sudden falling to the ground, without convulsions, and very temporary loss of consciousness.

Vomiting is a very constant symptom; it is sudden and explosive, especially when the growth is so situated as to cause pressure on the medulla.

Optic neuritis is found sooner or later in almost all these cases; it is important to make an ophthalmoscopic examination in all

cases of suspected brain tumor, as optic neuritis may be present without any disturbance of vision.

Optic nerve atrophy may be met with as the result of a primary neuritis in cases of tumors of long-standing. In all these cases gradually failing vision with later complete blindness will occur. Three theories are offered to explain this optic neuritis: 1st. Pressure and œdema. 2d. Descending neuritis. 3d. Vasomotor irritation. It will be unnecessary to enter here into the explanation of these theories. There are additional symptoms which depend upon the location of the tumor: reference to the chapter on localization in diseases of the brain and a study of the physiological functions of the brain will make this clear. If

FIG. 30.



Ophthalmoplegia externa in a child three and a half years old from tumor in the mid brain showing the double ptosis most marked on left side. Personal case. (Drawn from a photograph by Dr. Criado.)

FIG. 31.



Showing the divergence of the eyeballs owing to paralysis of the internal rectus on each side. It can be seen in the drawing that the pupil on the left side is larger than on the right. (Drawn from a photograph by Dr. Criado.)

the tumor is situated in the motor area, there may be localized spasm, with or without convulsions; subsequently, paralysis, or paralysis coming on slowly. If in the visual centres, disorders of vision, etc.

Tumors in the mid brain, in the neighborhood of the cor-

pora quadrigemina, give rise to a combination of symptoms which have been described as ophthalmoplegia; it is true that this condition may depend upon pathological changes other than tumor; such as lesions in the nerve nuclei or the periphery of the nerves involved. The symptoms are double ptosis and paralysis of the muscles of the eyeball supplied by the 3d nerve on both sides. These give the individual a peculiar appearance. The accompanying drawing will show clearly this condition, and for lack of space I must refer the student to the articles referred to for further detail.

Diagnosis. Gradual development of symptoms; headache, vomiting, epileptiform seizures, gradual onset of paralysis according to motor areas involved; optic neuritis. If the tumor is at the base of the brain, there is gradual involvement of cranial nerves; if in the mid-brain progressive paralysis of the 3d nerve on both sides, etc.

Prognosis is unfavorable in all cases of cerebral tumor, except in those which are clearly syphilitic.

Treatment. In the syphilitic tumors iodide of potass. in gradually increasing doses. Iodide ameliorates the symptoms in those cases which are not syphilitic, by diminishing the internal hydrocephalus, which is very likely to occur in all these cases.

Trephining is now adopted in those cases which present clear localizing symptoms; it should not be thought of unless such symptoms are present.

Bibliography.—Bramwell, Tumors of the Brain.—Mills, Tumors of the Brain, Pepper's System of Medicine.—Starr, Ophthalmoplegia Externa, Journal Nervous and Mental Diseases, 1888.—B. Sachs, Tumors of Mid-Brain, American Journal Medical Sciences, 1890.—J. C. Shaw, Ophthalmoplegia Externa, Brooklyn Medical Journal, 1891.—Weir & Seguin, Contribution to the Diagnosis and Surgical Treatment of Tumors of the Cerebrum, American Journal Medical Sciences, 1888.

Abscess of the Brain.

Etiology. It is most commonly caused by disease and injuries of the bones of the skull and face.

Symptoms. From injuries to the skull the symptoms are often more or less decided. Headache, slight fever, chills, vertigo, nausea, and vomiting; there may be attacks of localized spasm in the face, arm, etc., according to the location of the lesion, and this may give place later to paralysis; if the condition progresses to a fatal termination, there are added slow pulse, delirium or stupor, dilated pupils, coma, and death; or the acute symptoms may subside, and the abscess run a chronic course, when a period may follow in which there are very few symptoms, if any. In abscess the result of disease of the bones of the ear, which is by far the most common cause, or of the nose or face, the symptoms are often obscure; and there may be no definite symptoms for a long time; when they are present they are similar to those observed in abscess from injury. In chronic abscess, headache, nausea, and vomiting, with occasionally fever, are the most common symptoms; they are like those observed in cerebral tumor; sometimes the terminal symptoms only develop a few hours or days before the fatal termination. If the abscess perforate the brain surface, there is added a purulent meningitis with all its symptoms. If it perforate the ventricle, there are almost surely convulsions; and if life is prolonged a purulent basilar meningitis. If convulsions occur in cases of abscess, it may be localized or general. The convulsions and paralysis in these cases depend upon the seat of the abscess, and it is important if possible to locate them.

Abscess may occur anywhere in the brain. It is most common in the temporo-sphenoid lobe and cerebellum. In abscess of the cerebellum, there is often a remarkable absence of symptoms, especially if located in one lobe, and death often occurs very suddenly from pressure on the medulla. I have several times observed as a symptom in these cases an unusual hunger, the persons eating much more than usual or complaining of hunger frequently; death followed in a few days or weeks.

Pathological Anatomy. The abscess may be of any size. The nerve elements are swollen, break down, forming a granular soft mass mixed with abundant pus-corpuscles and some blood; the connective-tissue elements may be increased; there is always an effort to encapsulate the abscess, and in the chronic cases the abscess wall may be of considerable thickness. In some cases of abscess from disease of the middle ear a narrow long sinus leads from the portion of brain over the diseased bone to the main abscess some distance away like the subterranean passage-way into a mine. Around the abscess there may be considerable œdema. Thrombosis, purulent or not, of the adjacent sinuses is often found.

Prognosis. Unfavorable as a rule.

Treatment. Medicinal treatment is useless. Trephining offers the only prospect of cure. For this purpose it is important that there should be localizing symptoms.

Disseminated Cerebro-Spinal Sclerosis.

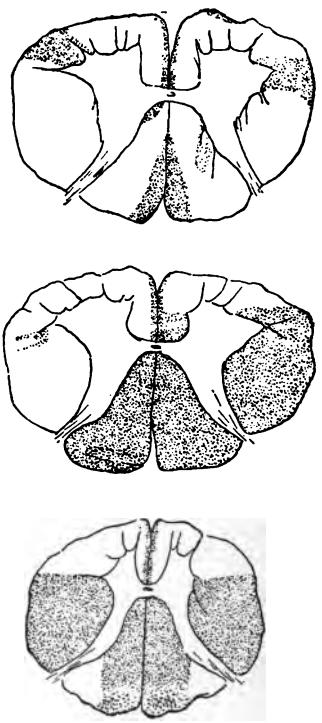
Etiology. It is observed in youth and middle age. It is said to follow blows; intense emotional excitement; it develops after the eruptive fevers, measles, typhoid, etc.

Symptoms. It may be confined to the brain or spinal cord alone, but most commonly it is cerebro-spinal, extending from the cord into the brain, or from the brain into the cord. It usually develops slowly, as paresis in the lower extremities, or in some eye muscle; slow and difficult gait with ataxia and paræsthesia. There may be some disturbances in sensation in places about the extremities or body. Vertigo; headache; tremor on voluntary efforts are common; speech is early affected, it is drawling, slow, and indistinct. Vision may be impaired; nystagmus is almost constant in this variety; there may be apoplectiform or epileptiform seizures, and there are contractures and rigidity in the limbs; the reflexes are exaggerated; tremor is almost constant, exclusively on voluntary motion; it is often so violent when attempting to take any object that it is almost impossible to do so. Its true character is

brought out by having the person attempt to take a glass of water to the mouth.

Trophic disorders, bladder and rectal disturbances are rarely found in this disease. In the spinal form the gait is decidedly spastic so long as the person can walk. When he cannot, the legs are stiff and extended; the disorder has a wonderful resemblance to spastic paraplegia, for which it can be readily mistaken.

FIG. 32.



The shaded areas show the scattered distribution of the sclerosis at various levels of the spinal cord in a case of disseminated cerebro-spinal sclerosis.

Pathological Anatomy. Sclerotic patches scattered at various points without any order throughout the cerebro-spinal axis.

Increased activity in the neuroglia and its cells, which soon becomes so great that the nerve tissue is injured; the nerve-fibres gradually disappear, leaving the increased connective tissue with its very much enlarged cells; the field of a section at this stage is best seen by reference to an illustration, showing the almost entire absence of nerve-fibres; a few axis cylinders are observed and a large number of "spider cells," cells with long processes.

Treatment. Tonics and alteratives are of service, but only as palliative, as the disease is steadily progressive.

Bibliography.—E. C. Seguin, J. C. Shaw, and A. Van Dervier.—A Contribution to the Pathological Anatomy of Disseminated Cerebro-spinal Sclerosis, Journal Nervous and Mental Disease, 1878.

Epilepsy.

Etiology. A neuropathic family history is to be traced in almost all the cases; rarely there is direct transmission. It occurs most frequently for the first time among young persons, and is most common between 10 and 20 years of age. As exciting causes, intense emotional excitement, fright, irritations (peripheral) of all kinds, from the intestinal tract, etc.; febrile diseases, injuries to the head, and falls are, I believe, frequent exciting causes in these predisposed children.

Symptoms. Frequently the first attack is without any warning; the child falls and is convulsed. In a proportion of the cases there is a premonitory symptom called an auræ, or "signal symptom" of Seguin. This may be a localized spasm occurring in the hand, or even in a finger, or on the side of the face, and extending to other parts (this is the type of Jacksonian epilepsy), followed by general convulsion.

It is sometimes a question whether an auræ is motor or sensory, as in some cases it may be due to a very slight spasmodic wave which is not perceptible even in the extremities, but especially in those auræ from the viscera, or if they be purely sensory as usually described by the patient. The sensory auræ is the most common perhaps; it is a feeling of tingling or numbness

in the parts, which extends up to the head. They sometimes speak of it as "something running up the leg" or arm, or from the epigastrium. At any rate it is a peculiar, indescribable sensation which these persons experience, apparently starting at some point in the body and radiating toward the cephalic extremity. I say apparently, because it is really due to central irritation, and what is felt is really a "referred sensation."

The auræ may be visual, when the person sees flashes of light, color, or even distinct objects, such as persons, animals, or even scenes; or they may be auditory, when he hears noises, voices, music, or singing: or olfactory, when he smells odors, which are disagreeable usually, such as sulphur, decaying animal matter, etc., or they may be pleasant. There are also psychic auræ; the person experiences a feeling of fright and dread, or he is in a confused, dreamy state.

The attacks are of two kinds—*petit mal* and *grand mal;* both of these forms of attack may occur in the same person. The attacks of *petit mal* are characterized by sudden loss of consciousness, temporary in duration; the person stops in any act which he is performing, and stares fixedly before him. He may remain perfectly quiet, and as soon as the attack ceases resume the acts he was performing before it; or he may jump up and hurriedly move about, opening a door or pulling up a curtain, etc., or start to undress, or running ahead a distance (precursive epilepsy). There usually is a slight tonic spasm of the entire body in these attacks, but no clonic convulsion. The attacks of *haut mal* or *grand mal* are ushered in by pallor, by dilated pupils, often by a loud piercing scream, simultaneous with loss of consciousness, falling to the floor, tonic convulsions. The face now becomes livid; clonic convulsions succeed the tonic; the head and eyes are often turned to one side; the arms and legs are thrown about in all directions; there is frothing at the mouth; biting of the tongue, which colors the saliva with blood; urine is passed; respiration is difficult and deep. Then there is a period of cessation of all the symptoms; after which the person may fall into a deep sleep. In some cases, this convulsion is soon succeeded by another, and there may be any number of attacks following one another—constituting "status epilepticus"

—during which the temperature rises very high ; and in some cases the person is found paralyzed on one side after the attacks cease—post-epileptic paralysis—from which he recovers. In other cases the attacks are characterized entirely by psychic disturbances ; the person performs strange acts, like undressing himself in the street, exposing his person or performing other unseemly acts ; or he may even commit crimes, such as breaking things, or killing his own children or other people ; or he may shout and sing, and have a true maniacal seizure. After the attacks of *grand mal*, he always complains of being sore in the muscles, owing to their convulsive action ; and there are frequently small ecchymotic spots under the skin.

Prognosis. This is a chronic condition. Some cases are very much benefited by treatment, and in a few cure possibly occurs.

Treatment. The most successful is the use of bromides, given cautiously and watched, increasing the dose gradually. Avoid stupefying the patient. The bromide should be given between meals, in water, or Vichy, as recommended by Seguin. Tonics are indicated in these cases, and quinine is the best, in small doses ; or small doses of arsenic, cod-liver oil, and nutritious food ; if there is a tendency to indigestion, pepsin may be given. In those cases where a study of the convulsive seizure or sensory aura gives evidence of a localized lesion, and in all cases due to fracture of the skull, the question of trephining may have to be considered.

Bibliography. — Gowers, Epilepsy, London, 1881. — Seguin, Opera Minora. — Seguin, Early Diagnosis in some Diseases of the Nervous System, Boston Medical and Surgical Journal, 1891. — Hare, Epilepsy, Philadelphia, 1890.

Paralysis Agitans

Is a disease of advanced life ; men are most frequently affected by it. It is evidently connected with degenerations of advancing years.

Symptoms. It may begin slowly or somewhat suddenly ; there may be some pains in the extremities, insomnia, and irri-

tability; but these are frequently absent. The disease usually begins as a trembling in the muscles of one hand; at first it may be intermittent, but later it is constant, except when asleep. The tremor is a slow rhythmical movement; the attitude of the

FIG. 33.



Showing the attitude in paralysis agitans. (Drawn from an illustration by Charcot, Maladies du Système Nerveux, tome i.)

hand is peculiar, the wrist is slightly flexed, the fingers bent downwards, the thumb lightly opposed to the index and middle *finger. The tremor* may for a long time be confined to one arm,

or extend to the leg of the same side; it is never so marked in the lower extremity as in the upper; the head may also be involved, and the tremor may even begin in the head. Dr. Amidon showed a case of the kind before the New York Neurological Society some years ago, and I have seen a few instances of it. The speech is often slow, and as the disease progresses muscular rigidity occurs to a certain extent, especially in the muscles of the back, so that the spine is more or less fixed; this gives rise to a peculiar bent-forward attitude, the head is inclined on the chest, in speaking the person turns the eyes up. The gait is characteristic: the person rises very slowly and with some difficulty from his seat. It is found that some persons show a tendency to run forwards, and Charcot found that pulling on the back of the dress of one of his patients caused a tendency to retropulsion. There are at times uncomfortable sensations about the body; but one which is almost constant is a sensation of heat and burning, the person sleeps with very little covering. As the disease progresses the health fails, the mind grows weaker, bedsores may form, and death is caused by some intercurrent disease; and from my own experience, Bright's disease is the most common. But death may occur from pneumonia, pleuritis, etc. There are occasionally observed cases of this disease without the trembling. One case of the kind has come under my observation, through the kindness of Dr. A. J. C. Skene. The characteristic gait, attitude, propulsion, burning sensation, etc., were all present in a typical form, but there was no tremor.

Pathological Anatomy. Nothing definite is known of the changes which give rise to these symptoms.

Prognosis. It is a slowly progressive disease.

Treatment. Is only palliative; attention to the general health, light nutritious diet. Tonics may be given; a host of remedies have been given, but they are all useless. Morphia may give some relief to the burning. Small doses of hyoscyamine, $\frac{1}{100}$ grain, two or three times a day, diminish the tremor and give relief. There should be freedom from work and anxiety. If there is insomnia, bromide soda, urethan, sulphonal, etc., may be used at intervals.

FIG. 34.



Showing position of hand in paralysis agitans. (After Charcot.)

Bibliography.—Charcot, Diseases of the Nervous System.—Peterson, N. Y. Medical Journal, 1890.

Spastic Hemiplegia in Children.

Etiology. Most of the cases occur in the first three years of life; but they may occur even at a later period. The disease is caused possibly by abnormal conditions of the mother during pregnancy. Accidents and injury to the mother are possible causes. Sinkler has insisted upon difficult and abnormal labors as a cause; injuries to the head; the infectious diseases.

Symptoms. It often begins, just after birth, with convulsions, either local or generalized; there may be a series of convulsions, coming on at intervals and lasting several days, with hemiplegia, which remains permanent; or the child may die within the first 24 or 36 hours. The disease, when it occurs later in life, is usually ushered in by convulsions, with or without fever. After the convulsions cease the child is found hemiplegic; the face is not always affected, but when it is, the disease often soon disappears almost entirely; the hemiplegia is usually not complete, so that the child soon learns to walk, although awkwardly. As the child grows the paralyzed side does not develop as fully as the other; the bones may be shorter; in the majority of cases contracture takes place to a greater or less degree; the arm may be flexed, the hand flexed, and the fingers drawn in. The reflexes are exaggerated; there is considerable motion in the parts, and the leg is never so much affected as the arm. In some cases there is very slight contracture; sensation is usually not affected; the electrical reactions of the muscles are normal. In quite a

proportion of these cases, sooner or later, epileptic convulsions occur, and the convulsive seizures may be confined entirely to the paralyzed side; but in the majority of cases there is a general convulsion, with loss of consciousness, etc., and the paralyzed side is most convulsed. In a considerable proportion of these cases there is imbecility. It is not uncommon to meet with post-hemiplegic trembling, post-hemiplegic chorea, and athetosis. The hemiplegic trembling may be present only when the muscles are put on the stretch; or it may be continuous during the waking hours; it is not made worse by motion, as in disseminated sclerosis, but is rather diminished, or entirely stopped by voluntary efforts; at least, when first made, in this respect like the trembling in paralysis agitans. The tremor is not so fine, steady, and rhythmical as in paralysis agitans. The choreic movements are mainly confined to pronation and supination of the forearm, and to flexion and extension of the elbow-joint. The movements are disorderly and irregular, and cease during sleep.

Athetosis is a condition of constant motion in the fingers and hand. The patient is unable to keep them in any fixed position: lives for years, and dies of some intercurrent disease, of which phthisis is one of the most common forms.

There is also observed in children a spastic paraplegia. The symptom may date from birth, but it frequently is not observed until some time afterward, when it is found that the child, whose legs are rigid, does not move them freely, and learns to walk late, when it presents all the symptoms of spastic paraplegia in the adult. There is also a bilateral spastic hemiplegia. This is nothing more or less than a hemiplegia on both sides, due to a lesion in the motor tract of each hemisphere, with secondary degenerations in the lateral columns. The subjects of this condition are usually imbeciles.

Pathological Anatomy. It is claimed by Strümpell that a large proportion of these cases are due to an acute polioencephalitis, analogous to the poliomyelitis of the anterior horns in children. This view is not accepted by all writers. The fact is the lesions which give rise to this condition are not fully made out; they evidently depend upon a variety of pathological

FIG. 35.



Spastic hemiplegia, left side; showing the contracture; arrests of development; epilepsy, and imbecility. (Drawn by Mrs. Shaw from photograph by Dr. Duryea.)

changes. Meningeal hemorrhages, resulting from rupture of the vessels during a difficult labor, with perhaps a weak condition of the vessels, owing to nutritional disturbances during intra-uterine life, are undoubtedly a frequent cause of these cases occurring just or soon after labor, or as the result of injury in later life, or from fatty changes in the vessels during the eruptive fevers. The hemorrhage gives rise to convulsions and ultimate changes in the brain, with atrophy.

The loss of substance in some cases is very great, and frequently confined to the motor areas.

Polioencephalitis may occur in some cases; the association of high temperature might lead to such a diagnosis; but it is very probable that a certain amount of encephalitis is set up in those cases of meningeal hemorrhage.

In a few cases I have had an opportunity of following to an autopsy: in three of them one entire hemisphere was atrophied to one-third its normal size; in one the loss of substance was confined to the motor zone and temporal lobes, the result evidently of hemorrhage from injury to the skull.

Treatment is of very little use except to relieve the contracture by friction.

Bibliography.—McNut, American Journal Medical Sciences, 1885.—Ross, Brain, 1882.—Osler, Monograph, 1889.—Sinkler, Medical News, 1885.—Sachs and Peterson, Journal Nervous and Mental Disease, 1890.

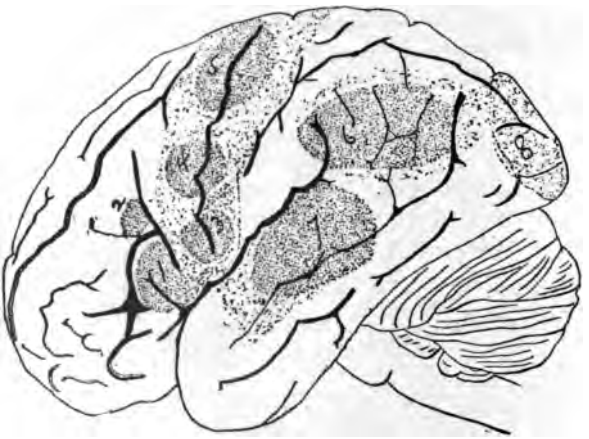
In the monograph of Osler and the essay of Sachs a more complete bibliography will be found.

Cerebral Localization.

Only a sketch of the subject can be given here. A reference to the accompanying diagram will show the motor area for the face, arm, and leg. Lesions which cause irritation in any of these centres give rise to localized convulsion or spasm in the muscles or limb of which it is the motor area. If the lesion is a destructive one, it causes paralysis. If the lesion is first irritative and progresses slowly to destruction, the spasm which at

first occurs, gives place later to slowly increasing paralysis of the part. In cases in which localized convulsion or sensory disturbances are the first symptom, "signal symptom" (Seguin), the convulsions may become generalized. It is important to learn which are the parts first affected by convulsion, or by any disturbances of sensation so as to locate the diseased area in the brain. These localized convulsive seizures from brain disease are often spoken of as Jacksonian epilepsy. If the convulsion or disturbed sensation begins in the face, the lesion is in the face centre; if in the arm, then the lesion is in the area for the arm,

FIG. 36.



1. Lesion in motor aphasia. 2. Supposed location of lesions in agraphia. 3. Motor area of face and lips. 4. Motor area of arm. 5. Motor area of leg. 6. Lesion in word blindness. 7. Lesion in word deafness. 8. Lesion in hemianopsia.

etc. To be sure you are correct about this, it is necessary to have a number of seizures, each one beginning in the same way. If there are visual disturbances, hemianopsia, or word blindness, the lesion is in the cuneus or angular gyrus.

Aphasia

May be caused by lesions in several parts of the brain. The student must again refer to the diagram (Fig. 36) showing the locations of these lesions. Lesions of the third frontal convolution on the left side, Broca's convolution, cause motor aphasia, loss of memory, for the motor combinations necessary to pronounce words. The person can understand what is said to him, but cannot repeat after you, or speak himself. He can recognize things about him, but cannot name them. He can hear and recognize what is said, but can make no reply.

Apraxia is now used to indicate disturbances in the sensory sphere which give rise to certain forms of aphasia. *The sensory aphasia.* To determine whether this form of aphasia exists, it is necessary to observe if the person recognizes familiar objects about him and their uses. He may see the objects, but be unable to recognize them. He may be able to see that there are letters in a book or newspaper, but he no longer recognizes them. He is unable to write, as he has forgotten the appearance of the letters. One of my patients, who had a slight apoplectiform seizure, told me, of her own accord, that for several days afterwards she could see food on her plate, but could not recognize what it was. The lesion giving rise to this symptom is in the angular gyrus. This is known as *word blindness.* A similar condition may affect the auditory centre. The person is no longer able to recognize sounds and their meaning, as he formerly did. He may hear the voice of one speaking, but the words uttered are to him no longer intelligible. He entirely fails to appreciate what is said to him, owing to the loss of memory for the sound of words, etc. This is *word deafness,* and it is caused by lesions of the posterior half of the first and second temporal convolutions in the left hemisphere, in right-handed persons.

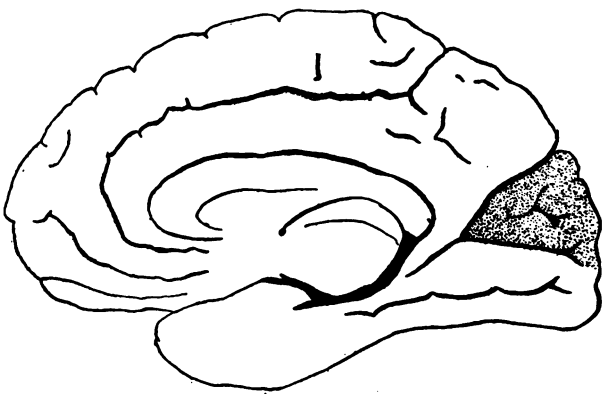
Agraphia is the loss of memory for the motor combinations necessary for writing, as motor aphasia is the loss of memory for the motor combinations necessary for speaking. The seat of lesion is believed to be in the posterior part of the second

frontal convolution. The student must not forget that in *word blindness* the person cannot write, but that this inability is due to the loss of memory of the appearance of the word.

Visual disturbances of a certain kind are caused by lesions in the occipital lobes, but more especially in the cuneus. This form of visual disorder is known as hemianopsia, often called homonymous hemianopsia ; it is blindness in the corresponding halves of the retina of each eye (a reference to the diagram will make this plain). If the person is looking straight forward, he cannot see objects to the left if the lesion is on the right side of the brain.

A lesion anywhere from the chiasm to the cuneus will cause this symptom, if in the line of the visual tract. If the lesion is in the cuneus, there is homonymous hemianopsia. If in the neighborhood of the thalamus so as to interfere with the sensory tract in the internal capsule, there may be hemianæsthesia. If in the neighborhood of the crus, so as to interfere

FIG. 37.

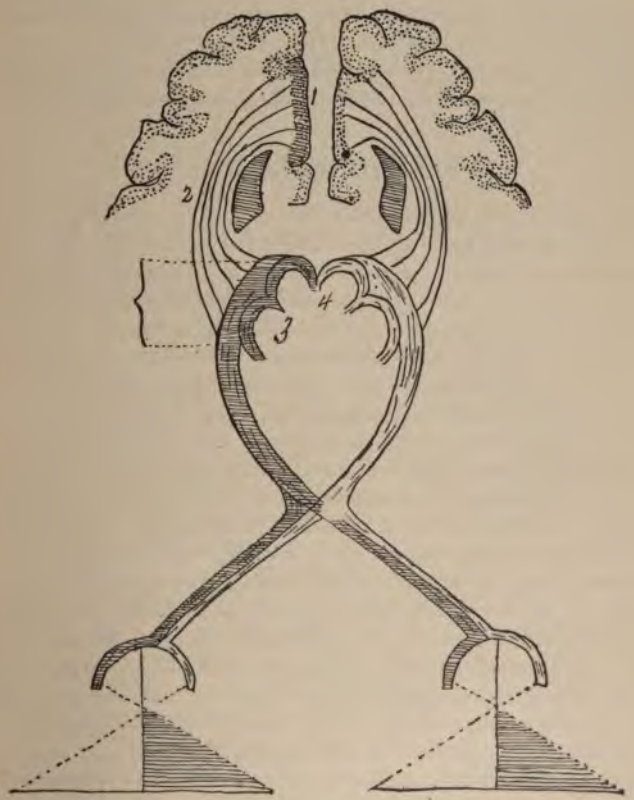


Lesion of cuneus in hemianopsia.

with the motor tract, there may be hemiplegia and paralysis of the third nerve on opposite side. These may be very temporary *symptoms. It has* been pointed out by Wernicke and Seguin

that a symptom may be present in some cases of hemianopsia which would differentiate a peripheral from a central

FIG. 38.



To show left lateral hemianopsia. (After Seguin.) Lesion in right cuneus. 1. Cuneus. 2. Optic tract in internal capsule. 3. Corpus geniculatum laterale. 4. Corpora quadrigemina, optic lobes. 5. Optic chiasm.

lesion; the "hemiopic pupillary reaction" of Wernicke or "hemiopic *pupillary* inaction" of Seguin. This symptom is

very difficult of demonstration, and depends upon the insensitiveness of the retina on the diseased side. If a pencil of light is carefully thrown through the pupil upon the insensitive half of either retina, it is found that neither iris reacts; hence "hemiopic pupillary inaction," if present, is evidence that the lesion is peripheral to the optic lobes and not central.

For more complete details refer to the articles on Hemianopsia by Seguin, Journal Nervous and Mental Disease, 1886 and 1887.

Subcortical Lesions.

Localization of lesions below the cortex and above the basal ganglia has only recently been attempted. This mass of white matter, the centrum ovale, is traversed in all directions by fibres of the projection, commissural, and association systems, bringing into communication the various masses of gray matter. It must necessarily follow that injury to any of these fibres which carry motor and sensory impressions and impulses would give rise to symptoms; but the investigation of these symptoms requires great care, and it is only very recently that such studies have been undertaken. There is not sufficient clinical evidence upon which conclusions can be reached to serve as a guide for localization of lesions in this area. Lesions of the corpus striatum and lenticular nucleus alone cannot be differentiated. It is rare, however, to have lesions strictly confined to these bodies. The fibres of the internal capsule are very likely to be involved, or some other fibres. If the internal capsule is much injured, then we have paralysis on the opposite side of the body, more or less great according to the extent of the lesion. Some evidence has been forthcoming recently which appears to show that lesions in the lenticular nucleus or its neighborhood may give rise to a set of symptoms which simulate very closely those produced by lesions in the medulla oblongata, and known clinically as glossolabio laryngeal paralysis or bulbar paralysis. This diseased condition of the nerve nuclei in the medulla has been alluded to under Progressive Muscular Atrophy and Lateral Amyotrophic Sclerosis. This was the only form of glosso-labio laryngeal paralysis known until 1872, when Joffroy suggested that there

might be a cerebral form. In 1877 Lepine reported the first two cases of this form of paralysis due to a cerebral lesion (Rev. Mensuelle, 1887). Kirchoff, in 1881 (Archiv f. Psych.), added another case: a man with apoplectiform seizures followed by difficulty in swallowing, saliva collecting in the mouth, difficulty in protruding the tongue, closure of the glottis performed slowly, speech difficult. Five months later deglutition is only possible when the head is thrown back, speech difficult, and saliva dribbles away. Later, the person is seized with flaccid hemiplegia on right side, followed by convulsions and death. Autopsy showed left corpus striatum a little flat; right corpus striatum depressed in its posterior two-thirds and softened. The corresponding part of the internal capsule is gray. The external third of the lenticular nucleus, the claustrum, the external capsule, and insula are soft, but without discoloration; the softening increases backwards in the lenticular nucleus. Microscopic examination of the pons and medulla shows absolute integrity.

In 1884 Drs. S. E. Fuller and Wm. Browning reported the case of a lady (N. Y. Medical Record) who had left hemiplegia with aphasia, from which there was entire recovery. Subsequently she was seized with an attack, followed at once by inability to speak. She could only make an expiratory guttural sound. "The lips, tongue, and muscles of deglutition were paralyzed; the saliva flowed from whatever angle of the mouth was lowest; the upper portion of the facial nerve was intact, and pupils reacted normally. The tongue was quite motionless. At the autopsy two fresh clots of blood were found in the lenticular nuclei extending into all the divisions and tapering off posteriorly. On the right side, in front of and external to the recent hemorrhage, were the remains of the former one. This was in the claustrum and external capsule." In 1885, Dr. B. Delavan reported (N. Y. Medical Record) the case of a man having suffered an apoplectiform seizure from which there was complete recovery. A year later he had an attack followed by marked hemiplegia, almost total inability to swallow, and a remarkable change in the quality of his voice; articulation impaired. There was no aphasia.

A number of similar cases have been reported in the last ten years. It is not unfrequently observed in cases of cerebral

hemorrhage or embolism that there is a difficulty in speech, thick, indistinct (not aphasic), or it may be associated with aphasia and difficulty of swallowing, which may be of temporary duration. The study of these cases, clinically and pathologically, is of importance. In 1881, in a note on the tendon reflex in general paralysis of the insane (Archives of Medicine), I intimated that there was an anatomical lesion which gave rise to the association of disturbances of speech (the ataxic paralytic form) and increased tendon reflex, and that it was in these cases apoplectiform seizures were most common. Owing to a unfortunate accident to some specimens, I was unable to demonstrate my findings and ideas on the subject, except to some friends. The publication of these cases of pseudo-bulbar paralysis is in support of my observations, imperfect as they were. I had observed, in autopsies of three or four of these general paralytics who had been carefully observed by me, and who suffered from frequent apoplectiform seizures, marked dementia, paralytic-ataxic disorders of speech of a very decided character, and a greater difficulty in swallowing than is ordinarily found in these cases, with increase in the tendon reflex softened patches in the corpus striatum, and more especially in the lenticular nucleus; the fibres of the internal capsule were also involved in these softened spots; they were never very large, and did not appear to be the result of a hemorrhage, but a breaking-down of the tissue. There were, of course, the other lesions generally found in this disease. (See General Paralysis of the Insane.) It appeared to me that these softened spots cut off, partially, fibres which are the paths of communication between the speech centres in the cortex and the motor speech innervations in the medulla, thus giving rise to the ataxic paralytic disturbances. The interference with the fibres in the internal capsule gave rise to the secondary degenerations in the spinal cord and the increased reflexes.

Ten years have not changed my opinion on this subject: that there are certain cases of general paralysis of the insane in which these paralytic speech disturbances depend upon a lesion in the lenticular nucleus or its neighborhood. I am well

aware, and was ten years ago, that lesions had been found in the medulla oblongata which were believed to explain, and probably did explain, some of the disorders of speech; but it was not the only part of the nervous system lesions of which might cause these difficulties of speech (not aphasic).

It appears, then, that lesions in the lenticular nucleus or its neighborhood may give rise to glosso-labio laryngeal paralysis, like that which was long ago observed in certain lesions of the medulla. The distinctive features are not yet clearly made out; in fact, the investigation of the subject has just begun. In the cerebral form there would probably be a history of one or more apoplectiform seizures, which are rare, if ever present in the bulbar form. Emotional disturbances and absence of muscular atrophy characterize the cerebral form.

Lesions of the pyramidal tract above the decussation and in the internal capsule cause hemiplegia on the opposite side of the body; the lower facial muscles, arm, and leg are paralyzed.

Lesions in the posterior part of the internal capsule, the sensory tract, or the optic radiations of Gratiolet cause hemianæsthesia; face, extremities, mucous membrane, taste, smell, are abolished; hearing and sight are diminished; there is restriction of the visual field and disturbance of color perception (Dyschromatopsie).

The degree of anæsthesia varies; the person cannot feel pricking, pressure on the parts, or the faradic current, and is unable to tell the position in which the extremities may be placed.

The visual tract to the cuneus is in this neighborhood, so that it may be injured, when there would be in addition hemianopsia.

Lesions of the thalamus give rise to no symptoms which, from our present knowledge, make them recognizable. Lesions of considerable size may cause symptoms such as hemiplegia, hemianæsthesia, or hemianopsia, but these would each depend upon the pressure or injury of neighboring parts; the peduncular tract in the internal capsule, the posterior part of the internal capsule, or the optic radiations of Gratiolet would be injured.

Lesions of the Corpora Quadrigemina or the Quadrigeminal Region or the Mid Brain. Until within the last few years, it

has been impossible to diagnose lesions in this region. At present we are in possession of some clinical facts which make this possible, in some cases at least. Hemorrhage into this portion of the brain is rare. Tumors occur, but not frequently. Lesions are rarely confined strictly to the quadrigeminal bodies. Formerly they were supposed to have something to do with vision; recent clinical observations appear to disprove this view. In a recent publication by Nothnagel, on the diagnosis of diseases of the corpora quadrigemina, he expresses himself as follows: The total substitution of the corpora quadrigeminal tissue by a tumor results in defective co-ordination. An unsteady reeling carriage during locomotion and station is a constant symptom; and this symptom depends upon the affection of the corpora quadrigemina themselves, not upon other parts of the brain being involved, nor upon secondary conditions, such as hydrocephalus. This disturbance of co-ordination is shown by an unsteadiness in walking and standing, a stumbling and reeling, altogether comparable to the staggering of a drunken man, or to that which appears in disease of the cerebellum or its vermiform process. It has no similarity to the ataxia of tabes. The upper extremities are completely free; only the gait and equilibrium of the body while standing are impaired. This unsteadiness of gait is not pathognomonic, as it occurs from lesions in other parts of the brain—the appearance of paralysis in the territory of the ocular nerves, especially the oculo-motor. The oculo-motor nerve troubles are to be referred to the nuclei and radical fibres of those nerves, not to the ganglia of the corpora quadrigemina. He thinks that the existence of ophthalmoplegia is of great importance as a diagnostic symptom of lesion in the quadrigeminal region when associated with other symptoms, particularly the uncertainty of gait above described. A special characteristic of the ophthalmoplegia in these cases is inequality of the degree of paralysis, especially in the early period, and in the extent of its distribution. Usually a difference between the two sides can be detected, a certain movement of one globe being merely defective, that of the other totally annulled. It is usual for only some parts of the oculo-motor nuclei to be affected, most commonly those related to the superior and inferior

recti. Occasionally the lateral movements of the eye are abolished, or ptosis may be the first and most marked symptom. Nothnagel summarizes as follows: "In a given case in which the signs point to the existence of a cerebral tumor there are grounds for localizing it in the corpora quadrigemina if the following symptoms are present: (*a*) An unsteady, reeling gait, especially if this appears as the first symptom. (*b*) Associated with this gait ophthalmoplegia existing in both eyes, but not quite symmetrically nor implicating all the muscles in equal degree."

I have observed two cases of ophthalmoplegia: the first in a very young child, with double ptosis and paralysis of the internal recti; there was partial coma at the time of my visit. She was too young to walk, therefore the unsteadiness of gait could not have been made out if looked for; an autopsy showed tumor of the quadrigeminal region. The second case, of which a reproduction from a photograph is given on p. 104, was three years and a half old. The first symptom was double ptosis, greatest on left side; when first seen this was the only eye muscle paralyzed, and the pupillary reactions were normal; there was no staggering. Later, the ptosis increased, and the internal rectus of right eye was affected at this stage. About four months from beginning of ptosis there were occasionally attacks of sudden dropping on the floor, without loss of consciousness, convulsion, or paralysis. At other times there was sudden loss of consciousness, as in *petit mal*. Neither of these two last conditions occurred more than a few times; large quantities of urine were passed which contained sugar; there were drowsiness, dullness, and irritability; the pupils still reacted normally; there was no paralysis of the extremities. Later, the left pupil was dilated, but still reacted to light and accommodation; it was only a few weeks before death that it was fully dilated and ceased to react to light and accommodation. The right pupil remained normal in size and reaction until a week before death. Ten days before death an attack occurred which, the mother thought, was a convulsion—from her description, most likely, apoplectiform—followed by intense irritability, screaming almost constantly, as if in pain—probably headache; pupils ceased to react; gradually coma and death came on. All efforts to obtain an autopsy were fruitless.

The ptosis was never equally great in the two eyes; there was no staggering or reeling. This was quite evidently a tumor developing gradually in the quadrigeminal region, slowly injuring the fibres of the oculo-motor and its nuclei. The preservation of the pupillary reactions to so late a date in the course of the disease was remarkable; this has also been noted in a case reported by B. Sachs. The inequality in the degree of paralysis in the two eyes, which has been pointed out by Nothnagel as characteristic, existed in this case to the last.

Lesions in the Crus Cerebri give rise to cross paralysis, that is hemiplegia (paralysis of the lower facial muscles and the extremities on one side) with paralysis of the oculo-motor on the same side as the lesion. If the sensory tract is involved, there would be hemianæsthesia on the side of paralysis and opposite the lesion.

Lesions of the Pons. If the lesion is situated in the upper part of the pons, the facial paralysis is on the same side as the paralyzed extremities. If the lesion is unilateral in the lower part of the pons, there is marked facial paralysis on that side; and there is motor and sensory paralysis, hemiplegic in type, on the side opposite to the lesion.

This difference in the condition of the facial nerve is explained by the decussation of the fibres in the middle of the pons.

Conjugate deviation of the head and eyes occurs, as in cerebral lesions high up, with this difference. In cerebral lesions high up, with paralysis on the opposite side, the deviation is to the side of the lesion and away from the side of paralysis. If the lesion is associated with convulsions, the deviation is toward the convulsed members. If the lesion is in the pons, the deviation is toward the side of paralysis and away from the side of the lesion. If the lesion is associated with convulsions, the deviation is toward the side of the lesion and away from the convulsed members.

If the fifth nerve is involved, as it would be in tumors developing in the substance of the pons, there would be anæsthesia in the distribution of the nerve, and perhaps painful sensations. In acute lesions of the pons there are fever and glycosuria.

Lesions in the Cerebellum. If situated in one lobe, and comparatively stationary, they may give rise to no localizing symptoms.

Fig. 39. Fig. 40. Fig. 41.

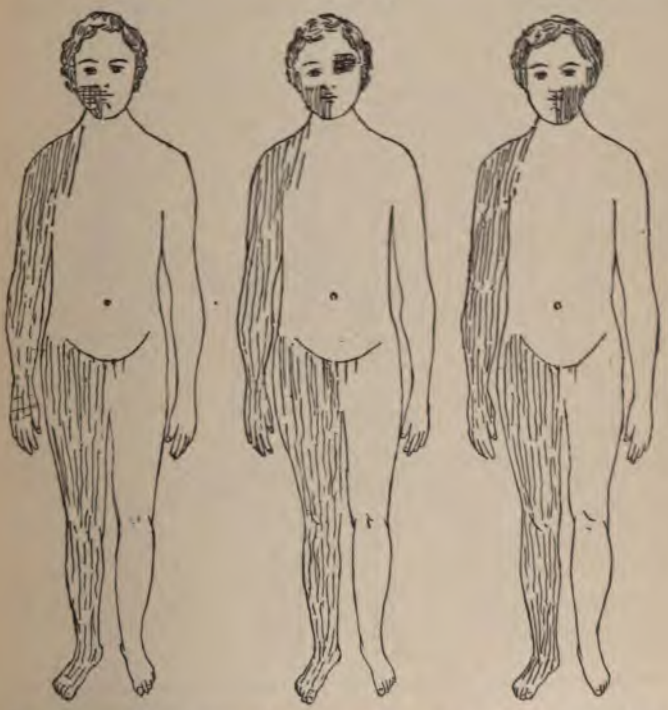


Fig. 39. Common type of hemiplegia occurring from hemorrhage in the neighborhood of the corpus striatum. The shaded parts indicate the distribution of the paralysis.

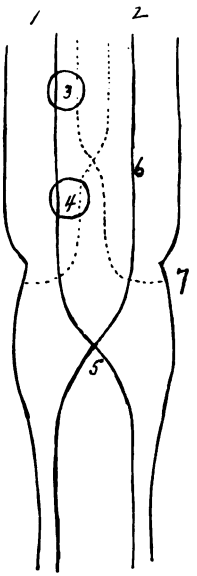
Fig. 40. The type of hemiplegia which occurs in lesions of the crus cerebri. Shaded portions indicate the paralyzed parts.

Fig. 41. Type of hemiplegia occurring in lesions low down in pons varolii. Shaded parts indicate distribution of paralysis.

The most common manifestations of lesions in this portion of the brain are headache, which is usually occipital, and is often

pretty constant. Vomiting is an early symptom; it is intermittent, and has a tendency to occur mostly in the morning. If the lesion is situated in a lateral lobe and is slowly progressive, it soon gives rise to symptoms. Lesions of the vermis give rise to unsteadiness, and a staggering, drunken gait; this is a symp-

FIG. 42.

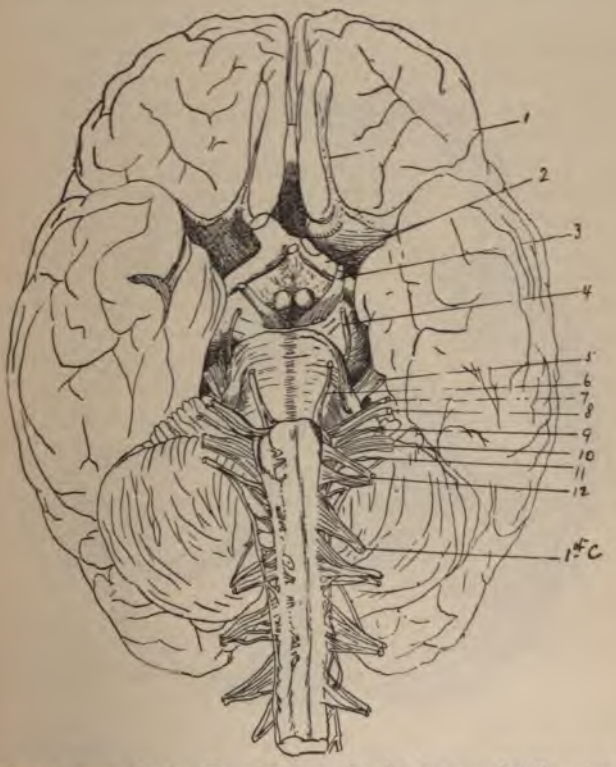


To show decussation of facial nerve in pons varolii. (After Nothnagel.) 1 and 2. Right and left half of pons. 3 and 4. Lesions at upper and lower half of pons on one side. 5. Decussation at pyramids in medulla. 6. Fibres in pons which decussate in the medulla. 7. Facial nerve-fibres. which are shown crossing in the middle of pons.

tom which may be very slight, and the uncertainty of gait manifested only upon rapid motions or suddenly turning round. Nystagmus in variety is common; it is vertical, horizontal, or oblique. Lesions in the cerebellum, as a rule, sooner or later give rise to additional symptoms, which are the result of pressure

on neighboring parts. The long course of the sixth nerve to reach its foramen of exit renders it very liable to be pressed upon by rapidly increasing abscess, cysts, or tumors. Other cranial nerves may also be compressed; those injured will de-

FIG. 43.

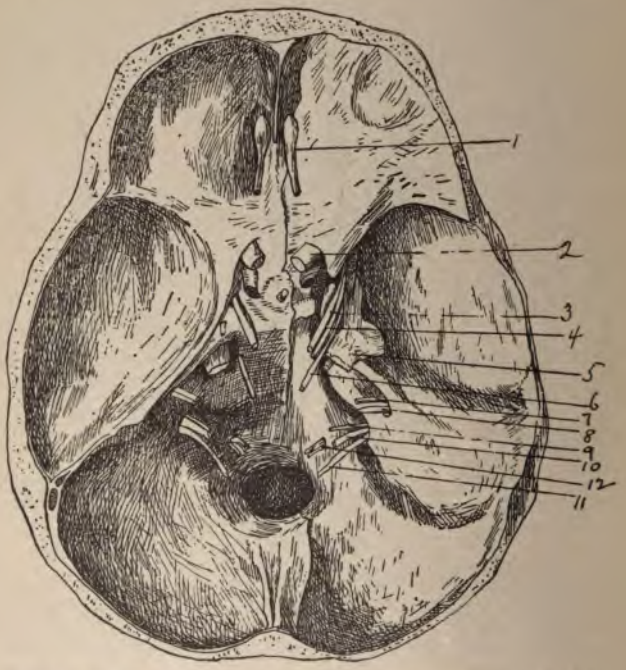


Showing base of brain. The numbers on the plate correspond to the nerves.

pend upon the direction in which the morbid product increases Choked disc—optic neuritis, is a frequent condition in lesions of the cerebellum, especially tumor. There may be some paresis or paralysis in the extremities on one side. This is evidently due

to pressure on surrounding parts. Anæsthesia is occasionally observed. In one of Seguin's cases it was located in the distribution of the fifth nerve and the tips of the fingers on one side. (Contribution to the Pathology of the Cerebellum, Journal Nervous and Mental Disease, 1887.) I have alluded to a few of the symptoms of cerebellar disease under Abscess of the Brain.

FIG. 44.



Showing base of skull with the cranial nerves as they pass through their foramen of exit; the numbering corresponds to the nerves.

Lesions at the Base of the Brain. Lesions in the anterior fossa are rare; disorders of smell would be a guide to their location. Paralysis is not caused by lesions in the part of the *brain resting* on this portion of the skull, unless they grow back-

ward so as to compress the cranial nerves situated further back. The most common lesions found at the base of the brain are tumors, syphilitic lesions, and aneurisms.

Tumors in the neighborhood of the pituitary body cause compression of the anterior perforated space, optic tracts, olfactory lobes, posterior perforated space, corpora albicantia; and if the tumor is large, the pons and cerebellum may be pressed upon, or they may encroach upon the nerves which pass through the sphenoidal fissure and the cavernous sinus. If pressure is great, there may be paralysis, but, as a rule, death occurs in these cases from paralysis of the respiratory centre long before pressure is great enough to cause paralysis. In a case of cystic tumor of the pituitary body, coming under my observation, there were headache not specially located; vomiting which occurred occasionally; attacks of sudden falling without loss of consciousness or convulsion, from which there was recovery at once; a passing paralysis of the right sixth nerve toward the end of the disease. In my examination two months before death there was choked disc. Death occurred very suddenly upon getting out of bed to use a commode. There may be glycosuria in these cases. Tumors anywhere in the neighborhood of the fourth ventricle, so as to cause irritation, may give rise to this symptom. A diagnosis is made of the location of lesions at the base of the brain by noting the nerves involved and their order of implication, in conjunction with the other symptoms. A reference to the illustrations of the base of brain and skull will make this clear.

Bibliography.—Amidon, New York Medical Journal, 1885.—Bernard, De l'Aphasie, 1885.—Seguin, Journal of Nervous and Mental Diseases, 1886–1890.—Ross, Aphasia, 1887.—Lichtheim, Brain, 1887.—Mills, Transactions Congress American Physicians and Surgeons, held at New Haven, 1888.—Starr, Cortical Lesions, American Journal Medical Sciences, 1889.—Starr, Sensory Aphasia, Brain, 1889.—Dana, Journal Nervous and Mental Diseases, 1889.—Ferrier, Functions of the Brain, 1886.—Ferrier, Localization of Cerebral Disease, 1878.—Ferrier, Croonian *Lectures* on Cerebral Localization, 1890.

SECTION IV.

Chorea.

Etiology. Heredity plays an important part in its production; it affects chiefly children, girls more frequently than boys; it may be due to anything which tends to lower the general vitality. There appears to exist a relationship between chorea and rheumatism. Fright, anxiety, over-strain at school, with confinement, are exciting causes in those predisposed.

Symptoms. The child becomes listless, inattentive, neglects its school work; intellect is dulled; poor appetite—soon followed by irregular muscular twitchings in the face or one arm, or may be confined to one arm and one leg. Occasionally there is paresis of one side as the first symptom; the muscular twitchings cause constant facial distortions; the arm is jerked from side to side in paroxysms; the child holds the affected hand with the sound one to prevent these movements. The choreic twitchings may be general, and it is almost impossible for the child to use its limbs; it stumbles and falls in all directions. I have seen one case in which all extremities, head, eyes, and muscles of the throat were affected; it was almost impossible for the child to speak and swallow.

While these muscles were twitching at intervals, throwing the parts into undesired positions, they were paretic; the arms and legs could not be moved voluntarily, and the head dropped in any direction if unsupported. Besides the pains in the limbs which some children complain of, there are no sensory symptoms. The little sufferers are always irritable, depressed, and emotional, and mentally inactive; if kept at school they cannot learn and take no interest in their studies. There is an endocardial murmur in some cases; the pulse may be irregular and weak. There may be several attacks, with intervals of a *few months or years.*

Pathological Anatomy. There are no distinctive lesions in chorea. Dana has attempted to sum up what is known of the changes (Brain, 1890). These consist of subcortical and basal hyperæmia, paralyzed, dilated, and badly nourished arteries, exudations in the lymph spaces, and similar changes which are evidently secondary.

Prognosis and Duration. The prognosis is favorable in almost all these cases, especially the acute ; the duration under treatment is usually from four to eight weeks.

Treatment. This should consist in removal of any cause which can be discovered. The bowels and digestion should be regulated ; ample light nutritious diet, with cold sponging night and morning ; abundance of fresh air, avoidance of close rooms ; the bed-rooms should be well ventilated, especially at night, keeping the children out of doors as much as possible. Absolute rest in bed has been advised, and may be suitable for those cases where there are excessively disordered movements or paresis associated with them. In other cases I prefer keeping the children out of doors, and allowing them to play about. If there is much pain, or a slightly elevated temperature, a few doses of antipyrine may be given, provided there is no serious heart lesion. If the child is in very poor physical condition cod-liver oil may be given. Of the medicinal treatment, Fowler's solution is one of the best, or pyrophosphate of iron.

Hereditary Chorea.

This is a condition which was first mentioned by Dr. Waters, of Franklin, N. Y., in a letter to Dunglison in 1842. It was a form of chorea found in certain families in his neighborhood ; it was hereditary ; rarely appeared before adult life ; was incurable, and dementia always followed. Twenty years later, Lyon wrote about it (American Medical Times, 1863) ; he gave three histories in which five and three generations were affected.

In 1872 Huntingdon described it in a few cases on Long Island. He says that it affects males more frequently than females ; and comes on gradually, always after middle life, and is incurable ; *it always* ends in insanity, and there is a tendency

to suicide. (Phil. Medical and Surgical Reporter, 1872.) Clarence King, in 1885, gives the family history of the disease. It is hereditary, and affects a great many members of a family, and for several generations; it affects both sexes, and begins usually after twenty-five years of age; it may be transmitted through the paternal or maternal side. It does not develop from ordinary chorea, and begins without apparent cause by a twitching of the face, then the arms are affected, and later the legs, or it may begin as a general twitching. The movements may be violent and coarse in character; in the leg it produces a peculiar gait; there is sudden stopping; the persons look as if they were going to fall forward, the body sways; at last they are able to take a few rapid steps, and so recover their balance. In most cases the movements cease in sleep. There is no wasting of the muscles, no anæsthesia, the deep reflexes are normal or somewhat increased; the electrical reactions are normal. There is no heart disease; rheumatism is not associated with it, as in ordinary chorea. The bodily functions are normal. It is very commonly followed by some mental disorder. The choreic insanity begins with loss of memory and childishness, gradually passing into dementia.

The Pathological Anatomy is not known. A few autopsies have shown subdural hemorrhage; one, multiple tumors of the dura mater.

Bibliography.—Sinkler, Pepper's System of Medicine.—Herringham, Brain, 1888.—Sinkler, Journal Nervous and Mental Disease, 1888.

Neurasthenia.

(A Condition of Exhaustion of the Nervous System.)

Etiology. A predisposition to it may be inherited or be acquired. The nervous, highly active, restless temperament is most subject to it. It usually occurs at a time of life when the anxieties and work inseparable from our mode of existence are in full operation. It is brought on frequently in *men by too prolonged* and anxious work, and excesses of all

kinds, which lower the vitality. In women, by cares and petty annoyances, with an enervating mode of life; too rapid pregnancies, the drain from lactation, profuse discharges of blood. Exhausting diseases of all kinds may bring it on.

Symptoms. It exhibits the most wonderful variation in its symptoms, and yet there is a similarity about them which makes the disease distinct and easily recognizable, at least in its typical manifestations. A number of divisions have been made, such as cerebral, spinal, sexual neurasthenia; but these are purely arbitrary, and simply have for their basis a preponderance of symptoms referable to the brain, spine, and sexual apparatus, etc., but, after all, the condition is general. The symptoms most commonly met with are inability for exertion; the person is easily tired, has no ability to do mental work; he is confused, gets headache on the least effort, has vague pains about the head, and neuralgic-like pains about the body, with sensations of prickling and numbness. The head and neck tire easily and ache; tender painful spots may be felt at one or more points along the spine; sleeplessness is common. The sufferers are apprehensive and anxious unnecessarily; dread they will have some serious disease. On the least exertion they have palpitation; perspiration breaks out on them, and they have flushing of the face; there may be palpitation which occurs at night and wakes them, causing them great distress and anxiety. They dislike to make mental and physical effort. Dyspepsia often comes on, either as a complication, or was the original difficulty. When they take food they are distressed and uncomfortable; the head symptoms are made worse. They are confused and dizzy; palpitation may occur; they gradually leave out of their diet first one and then another article, until they have got themselves down to a starvation point, making their condition rather worse than better. Their attention becomes concentrated upon themselves and their organs. Many of them become hypochondriacal often about their sexual apparatus, and they consult one physician after another. A feeling of constriction about the head, with discomfort and pain on the top of the head, is very common. These persons are usually pale and anæmic, with appetite poor, bowels *constipated*, spirits depressed, and facial ex-

pression often anxious. They avoid strangers, and may develop morbid fears of all kinds. They remain in the house, on the plea that going out makes them uncomfortable, increases the pains in the back and head, tires them ; or they dread that something will happen to them, that they will faint, or have an attack of paralysis, etc.

Prognosis in these cases is always favorable ; all these patients will get well under suitable treatment.

Treatment. Remove the causes which have operated to bring about the condition ; avoid over-work, and, above all, anxiety, if that be possible ; stop any drains which are being made on the system, such as hemorrhages, lactation, etc. A good ample supply of food is most important, with fat of some kind in the winter ; cod-liver oil or cream can be used. Medicinally, tinct. nux vomica may be taken before meals, with pepsin after meals, and if there is much gas formed in the stomach and intestines, charcoal may be added. The bowels should be kept regular, if they do not act when the full meal is taken, with nux vomica, cascara sagrada, or the small granules of aloin, belladonna and strychnia can be given at night. If there is much anæmia, later, quinia and iron or arsenic can be given. The person should live out of doors, if the weather admits, and if possible remove to some new locality, temporarily, with cheerful surroundings. He should be encouraged to take moderate exercise at first, gradually increasing it, but never to excess. Cold sponging in the morning is of service in a large number of cases. Stimulants should be avoided. This line of treatment should be continued for a long time.

Bibliography.—Beard, Nervous Exhaustion.—Cowles, Boston Med. and Surg. Journal, 1891.

Headache, Cephalalgia.

Headache, the result of organic brain disease, such as tumor, is not included under this head.

Any cause which lowers the general tone may give rise to it—such as anæmia from any source, the presence in the blood of

material foreign to it, or the permeation of the organism by poisonous substances—tobacco, lead, products of defective assimilation, etc. It may be the result of irritations and disturbances in other parts of the organism—such as disorders of the stomach, constipation, disease of the teeth, nose, throat, or eye; or it may occur from sleeping in badly-ventilated rooms, from the inhalation of deleterious gases. It also occurs in gout, in rheumatism, and in neurasthenic individuals. It varies very much in its severity; it may be constant or intermittent, general or localized. An attempt has been made to classify these headaches according to their cause, and it is believed that certain sources of irritation give rise to a headache localized in a special part of the head; for instance, the headache of indigestion and constipation is frontal, while the headache of anæmia is on the top of the head. The location of the headache is not always a guide to its etiology.

Anæmic headache occurs mostly in women; it may be diffuse, on the top of the head, or the temples; it is found in pale and bloodless persons; it is often associated with fainting attacks; it is made worse by want of nourishment, rest, and sleep; overwork and anxiety increase it.

Congestive headache is found mostly in men, and is associated with full blood, congested face, throbbing arteries, and vertigo, with a feeling of fulness in head.

Hysterical and neurasthenic headache are very much alike, and are often located on the top of the head, or on one side, described as boring; made worse by worry and menstruation.

Toxic headaches are usually general, but they may be frontal; tobacco, opium, iron, and other drugs may cause it. Seguin has pointed out that the headache of uræmia is often occipital.

Syphilitic headache is often very severe, and may be general or localized; is apt to be worse at night; is usually constant.

It occurs in young children who are of a nervous temperament and use their eyes too constantly, or tax their brain beyond its endurance and powers, and who are worried and anxious about their work. Sinkler says it may be associated with enlarged tonsils.

The *treatment of* headache must depend upon its cause; this

must be sought after. In the anæmic headaches, tonics, arsenic, iron combined with a saline, if the person will tolerate it; nutritious food, some wine; cold bathing with friction. The digestion should be strengthened with some stomachic bitters, or pepsin may be given after meals; the bowels should be kept regular. In the syphilitic headache, iodide of potassa. In the hysterical and neurasthenic headaches the treatment indicated for the anæmic form, for the relief of a paroxysm, 1 to 3 grains of citrate of caffein will be of service. In toxic headaches the cause must be removed. In nervous, highly neuropathic children, avoidance of over-work and anxiety, plenty of fresh air out of doors, plenty of light nutritious food, cold bathing. In those cases which appear to depend upon strain of the eyes, if there is refractive trouble it should be corrected, but this alone, in my experience, does not always cure the headache, but for the time relieves it; there is a neurotic condition, the basis of the cephalalgia; all sources of peripheral irritation should be sought for and corrected.

Exophthalmic Goitre.

(Graves's Disease.)

Etiology. This disease occurs almost exclusively in women. Heredity plays a prominent part as a predisposing cause. Disturbances in nutrition, anæmia, chlorosis, drains upon the system by profuse discharges of blood, illnesses which lower the vitality, are exciting causes of its outbreak. Mental anxiety and disappointments are fruitful sources of it in predisposed persons.

Symptoms. It begins with palpitation, rapid pulse, which may reach, eventually, 120 or 150 beats per minute; it may begin gradually, or the symptoms may be ushered in suddenly, as the result of fright or other profound emotional disturbance. Enlargement of the thyroid gland occurs as a very constant accompaniment; the degree of enlargement varies very much; vomiting occasionally occurs, with dyspeptic symptoms, and there may be a disposition to vomit when certain kinds of food are taken. The appearance of these symptoms *varies. In some* cases there is a light swelling of the thyroid

gland in its entirety or in one lobe for a number of months before the palpitation occurs; in others the palpitation is the first to appear.

Exophthalmus, more or less extensive, soon appears; it may be so great that the lids cannot be closed over the eyeballs. Von Graefe pointed out that the upper lid loses its power of moving in harmony with the movements of the eyeball. In some extreme cases ulcerations of the cornea may occur and the sight be lost in consequence. Slight elevation of the temperature may occur. The person is excessively nervous, easily agitated, and frightened.

Pathological Anatomy. Changes have been found in the thyroid gland, and in the cervical sympathetic and its ganglia, while some observers have not found them in these bodies. These changes are not constant, and there is nothing definite known of the pathological anatomy of this disease.

Diagnosis. When the symptoms are well developed, it presents no difficulty.

Prognosis. Is unfavorable as a rule. Some of the cases improve, but there is great danger of relapses.

Treatment. Is unsatisfactory. Digitalis and other remedies for slowing the heart's action have been given with very little result. If nutrition is impaired, tonics, quinia, arsenic, and iron, with nourishing diet, change of scene, cold sponging, galvanism, and removal of any source of anxiety which it is possible to relieve, are needed. Faradism has been advocated.

Angina Pectoris.

Etiology. It may be a symptom of organic disease, fatty degeneration of the heart, or disease of the coronary arteries.

The neurosis is an obscure affection and appears to have an hereditary basis; it is found in families, the members of which are subject to hysteria, epilepsy, or other nervous disorders. It may be an hysterical symptom; such a case has fallen under my observation. Males are said to be the more frequently affected. Excessive use of tobacco may cause it.

Symptoms. *It comes on suddenly in paroxysms of variable*

duration. It begins by pain in pericardial region, extending [redacted] side of neck, and down left arm; there is intense difficulty [redacted] breathing, oppression associated with pain of a shooting, tearing character. The person is in great distress and anxiety, face pale, cold perspiration over the body. The pulse may become feeble and intermittent. The attack lasts usually a very short time. The arterial tension is increased at the beginning of the attack, later it is diminished.

Diagnosis. Examination must be made to learn if the symptoms depend upon some diseased condition of the heart, or upon a simple neurosis.

Prognosis. Is always serious.

Treatment. If due to tobacco, its use should be avoided. If dependent upon cardiac disease, the treatment appropriate for that condition should be adopted. In the condition of nervous origin, ether, chloroform, hypodermics of morphia may be used. In the form with vascular spasm, inhalations of amyl nitrite often give prompt relief. Between the paroxsyms tonics, quinine, arsenic, should be given. Galvanism has been used.

Unilateral Facial Atrophy

Is, as its name implies, a gradual wasting of the muscular tissue on one side of the face.

Etiology. It is more frequent in women than in men; it occurs usually at a comparatively early age, under thirty, and in a few cases recorded between ten and fifteen years of age. It appears to occur more frequently on the left side of the face.

It has followed the eruptive fevers, pertussis, and other diseases. In a few cases there has been pain in the superior maxillary region; its etiology is not clear.

Symptoms. It begins as a discoloration on the side of the face in spots, which spread; these spots become yellowish and depressed; the face gradually grows thinner on that side as the tissue gradually wastes; the hair undergoes changes as well as the skin, and may become perfectly white. The cutaneous sensibility is usually not affected; the skin becomes drawn, wrinkled, and hard, but it is not adherent to the bone. The

electrical reactions are, as a rule, said to be normal. The degree of atrophy varies very much. The bones have been found diminished in size. In a case which I have had the opportunity of seeing, through the kindness of Dr. S. Sherwell, the atrophy was extreme, and both sides of the face were affected; the woman, although young, looked as if she were very old; there was no anæsthesia.

Pathology. Two theories are offered in explanation of this condition: one is that it depends upon a disorder of the vaso-motor system; the other, upon a disorder in the trophic fibres of the fifth nerve. It is difficult at present to say to which of these two theories the greater weight should be given. The disease may depend upon a disturbance in both, as the fifth nerve and sympathetic are so intimately associated. Cases have been recorded in which injury to the sympathetic has appeared to cause it.

Diagnosis. It may be mistaken for an asymmetrical face, but in this condition there is absence of the discoloration and atrophy.

Prognosis. It is not dangerous to life.

Treatment. Very little can be said on this subject.

Hysteria

Is a morbid state of the nervous system in which the clinical manifestations present the most wonderful variety, and in a remarkable manner simulate organic disease; there is often increased physical irritability. It is often manifested by neuralgic-like pains, hyperæsthesias, hallucinations, convulsive and paralytic phenomena.

Many years ago hysteria was supposed always to be the result of disease of the uterine appendages, and, consequently, a disease confined entirely to women; but it is now known, thanks to the labors of Prof. Charcot and his pupils, Seguin, Walton, J. J. Putnam, Page, and many others, that it occurs frequently in men and young children. The name hysteria is used in a sense very different from that in which it was formerly used, and does not indicate, in the least, that the condition depends upon abnormal states of the uterus. This it is important to keep in mind.

Etiology. Heredity plays a most important part in its production. There may be a direct transmission of hysteria from the parent to the child, or there may be other nervous manifestations in the members of the family and its branches, such as epilepsy, chorea, neuralgia, insanity in some of its phases, or some other nervous disorder. It occurs more frequently in women, but it is much more common in men than is ordinarily believed; it occurs in boys and girls at a tender age, or about the time of puberty. Briquet found that one-eighth of his cases were in children under ten years of age. Anything which lowers the general tone of the nervous system may give rise to it in these over-sensitive, predisposed persons. Hemorrhages, severe illness, poor food, anæmia, over-work in occupations which are not congenial, anxiety, fright, jealousy, disappointments of all kinds, make a profound impression; so does an education which fosters and stimulates this inherited instability. The enforced social restrictions of women, which they often inflict upon their young children, with lack of proper exercise for physical development, and an artificial and premature education and habits heighten this predisposition. But it occurs in persons, men particularly, of robust physique, who, up to the time of the first hysterical manifestation, have not exhibited the least morbid emotional susceptibility. Accidents are a frequent cause of the first appearance of the condition, as has been clearly pointed out by Charcot; and several well-marked cases of the kind have fallen under my observation. Putnam and Walton have also recorded a number of such cases. The disease may, at times, occur in young girls who have witnessed attacks in others.

Symptoms. Hysterical persons often complain of some of the symptoms found in neurasthenia, neuralgic-like pains in various parts of the body, and hyperæsthetic areas about the abdomen, chest or back. A frequent location of them is in the neighborhood of the ovary, mammary gland, etc. There may be anæsthetic patches in various parts of the body, or there may be complete hemianæsthesia, which is associated with anæsthesia of the mucous membranes. The special senses on that side are involved, sight, taste, and hearing. There may be restriction of

the visual field for color. The degree and completeness with which these manifestations present themselves vary.

There may be irritations of the bladder and urethra. Patients often complain of pain in the joints, which may be mistaken for joint disease, especially if there happen to be some swelling. Sir Benjamin Brodie called attention to the frequency of these hysterical joint troubles; and more recently, in this country, Newton Shaffer has made a valuable contribution on the subject. In some cases of hysteria the senses are exceedingly acute. Persons notice odors which are not perceptible to others; they are often made very sick by odors which have no influence on normal individuals. On the other hand, they may have a liking for odors and substances disagreeable to other persons; these perverted senses are well shown in an abnormal taste, in eating soap, slate pencils, small chalky or soft stones, etc. The hysterical manifestations in some are simply an exaggeration of their emotional state; they laugh and cry without cause. Where there is a more or less profound attack, there are likely to be present a number of hysterical manifestations. In the anæsthesia which occurs in these cases, as a rule, the sensibility to pain is alone overcome; the other forms of sensibility are normal; occasionally tactile sensibility is disturbed, and the muscular sense may in some cases be abolished. The anæsthesia may affect the mucous membranes of mouth, pharynx, and nose; and in consequence the reflexes of the parts are abolished. The secretions may be diminished or arrested. Spasmodic convulsions and paralytic phenomena may occur. The spasmodic attack may be of great variety: it may be rhythmical; it may simulate the trembling of organic disease; be confined to one member or involve the entire half of the body and be hemiplegic in type; it may be coarse, as in disseminated sclerosis; or fine tremor, as in paralysis agitans; or may simulate the pre- and post-hemiplegic trembling of organic disease; it may occur in any muscle or group of muscles in the body; it may manifest itself as contracture, which may be intermittent or last continuously for months and years. Prof. Charcot has pointed out the permanency of these conditions and the obstinacy to treatment which often characterize them. These

contractures may be confined to the masseter and other muscles in their neighborhood, causing trismus. Many years ago I published the record of a very obstinate case of this kind (Hysterical Trismus, Transactions of the American Neurological Association, 1887, vol. 2), which lasted for months. Spasms of the glottis may take place, giving rise to severe dyspnœa; or of the pharynx, causing difficulty in swallowing. Globus hystericus is rather a constant symptom, but not so frequent as it is often thought to be. Persistent and severe vomiting often occurs; but the nutrition rarely suffers materially from these attacks. Retention of urine is frequent, owing to spasm of the sphincter; and the catheter may have to be used for months.

Paralysis occurs in these cases; it is variable in distribution, and may come on suddenly after a convulsive attack or without it; it may be flaccid or associated with contracture; it may come on slowly; it may be confined to one limb or be hemiplegic in type. Some years ago I was consulted by a lady whose domestic relations were not agreeable. After an unpleasant occurrence in her home she was suddenly seized with contracture of the right leg and partial trismus, which had lasted many months without abatement when I saw her. These paralytic phenomena may disappear in a short time to occur again in the same parts or in some other parts, after the lapse of a few months. I have recently observed these manifestations in a young girl. There may be no anæsthesia in these cases. This young woman, in addition to the paralysis, had only a darkening in the centre of the visual field. Objects appeared to be in the shadow as the centre of the field was approached; in the centre of the field they were dark, as if observed in the night. The color perception was not changed, and there was no anæsthesia.

These persons are impressionable; easily affected by pleasurable or painful impressions; and there is often a morbid craving for sympathy and attention. This morbid state may present itself in persons who had previously not shown the least sign of nervous impressionability. They may show a tendency to moral perversions: lie, steal, quarrel with and intrigue against their own family. They often form attachments and dislikes to per-

sons without obvious reason, and as frequently change them. They often manifest an aversion to certain creatures, such as frogs, spiders, mice, cats, etc. Others show a desire to deceive, often for deception's sake; or to make themselves the objects of curiosity and wonder. To this end they drink urine and eat excrement, which they vomit up, or they pretend that urine passes through the navel or other part of the body; or they may inflict injuries upon themselves, which, they pretend, were inflicted in some other way; or they may pretend that they had attempted suicide. They would have us believe they fast.

Others are painfully depressed; they are sad, have forebodings, or are compelled to the performance of certain acts. On this border-line we approach the hysterical insanities on the one hand, and the imperative conceptions and neurasthenics on the other. A record of these morbid manifestations in hysteria would fill a long chapter.

Convulsive Seizures. Hystero-epileptic attacks in their greatest severity are not apparently of so frequent occurrence here as in Europe, especially in France; but this may be due to the large hospitals for chronic cases where patients are massed together. These convulsive seizures often are preceded by a feeling of general discomfort, or of hallucinations of vision and hearing, such as the cries and sight of wild animals. They are usually sudden, but they may be preceded by an "aura," globus hystericus, singing in the ear, or obscuring of the visual field. Respiration is spasmodic; consciousness is obscured; the convulsion may be similar to that of epilepsy of moderate severity. In some cases the body is thrown into all sorts of contortions and attitudes. An extreme opisthotonus may be present, the body bent backwards, resting on the head and heels. I have observed a case with these characteristics in a student. Or there may be various contortions of the body, which are fixedly maintained for some time. The legs and arms are thrown about. The persons make gestures and noises. They sometimes have religious ideas, which have an influence over the attitudes assumed during the convulsion; or they have ideas of demoniacal possession, which give rise to hideous facial expressions. Prof. Charcot has depicted, with illustrations, a number of these strange

attitudes and facial contortions. The convulsive seizures may be less violent and demonstrative. A case of my own illustrates well the milder attack. A man, aged eighteen, of robust physique, in perfect health, had never manifested any tendency to nervous derangement. One day driving a spirited horse, having occasion to get out of his carriage, before he could get in again the animal became frightened and tried to run away. He caught the horse by the nose, which in his struggle to free himself jerked about the young man, and finally threw him some distance away; he landed on his feet without injury. As the horse did not succeed in getting away the young man resumed his seat in the carriage and drove home. When he reached home he was observed to be delirious. He went to bed; the next day was unable to raise the right leg, and was apparently paralyzed, as his family physician said. His family were exceedingly solicitous about him, especially his father, who watched him carefully, took his pulse and temperature, upon which he always put an erroneous construction and exaggerated importance. Very early the young man began to complain of pains in the back and of pain when he was moved. A specially constructed bed was made for him. Some months after the occurrence of the accident and the development of the paralysis in the leg, he began to have convulsions, not of great severity; but consciousness was either clouded or lost. With this attack there were also associated constantly a quivering and twitching of the partly closed eye-lids. The family and family physician took a most gloomy view of the matter, and when I made a diagnosis of an hysterical condition and probable favorable prognosis, the father was almost offended. The patient remained in bed for two or three months longer, when one day he suddenly announced that he thought he could walk, and he got out of bed and walked about. Many similar cases are recorded by Charcot and others. For further details on this very interesting subject I must refer the student to the authors whose works are appended to this short chapter.

One phase of this condition deserves mention here, and it is the association of hysterical symptoms with organic disease. This association often leads to great difficulty in diagnosis even

by experienced clinicians. I can merely allude to its occurrence here.

Bibliography.—Charcot, Leçons sur les Maladies du Système Nerveux, tome 3.—Jolly, Hysteria, Ziemssen's Cyclopedia of Medicine.—Seguin, Hysterical Symptoms in Organic Disease, Opera Minora.—Putnam and Walton, Journal of Neurology, 1884.—Page, Injuries of the Spine.—Mills, Hysteria, Pepper's System of Medicine.—Buzzard, On the Simulation of Hysteria by Organic Disease of the Nervous System, Brain, 1890.—Mitchell, Nervous Diseases.

Vaso-motor Neurosis.

The bloodvessels are under the control of the vaso-motor system of nerves. There is a vaso-motor centre, or, as it is sometimes called, monarchical vaso-motor centre in the medulla oblongata; each half of the body has its own centre; stimulation of which causes contraction of all the arteries; paralysis, dilatation of all the arteries. Under ordinary circumstances the centre is in a state of moderate tonic excitement. It may be excited directly and reflexly, just as the cardiac and respiratory centre are. Besides this monarchical vaso-motor centre there are subordinate centres in the spinal cord; injury to the cord therefore causes dilatation of the bloodvessels; if the injury is high up in the cord these subordinate vaso-motor centres below the seat of injury, as soon as they have recovered from the shock, again control the bloodvessels and restore the tone of their muscular coat; they may, however, not do so completely. There are nerve-fibres whose stimulation causes the vaso-motor centre to produce a strong contraction of the arteries, and consequently a rise in the arterial blood pressure; these are called "pressor" fibres. There are also fibres whose stimulation reflexly diminishes the excitability of the vaso-motor centre; these are known as "depressor" nerves. Section of the vaso-motor nerves, say in the cervical sympathetic, is followed by dilatation of the bloodvessels of the parts supplied by it; there are redness and increased temperature of the part; and there

may be increased transudation through the vessels so as to give rise to a moderate œdema.

This nervous mechanism may be injured or disordered in the medulla or in the spinal cord, the sympathetic ganglia, or in the afferent fibres. The vaso-motor centre in the medulla oblongata is influenced by the cerebrum, as is shown by sudden pallor in fright or blushing under some emotion. It is thought that it is a composite centre, each part presiding over a particular vascular area. Poisons may excite the vaso-motor nerves or paralyze them; irritations at a distance may reflexly cause the same effect. For further information on this subject the student is referred to Landois' Physiology, and Vulpian's Leçons sur L'Appareil Vaso-moteur.

There are observed, clinically, a number of conditions which are very evidently due to disturbances of the vaso-motor system. The exact cause of disturbance in a given case is very often difficult to determine. Every possible source of peripheral irritation should be investigated, the condition of the pelvic organs, the kidneys, liver, heart, stomach, etc.; it may be the result of the presence of some morbid product in the blood. It occurs very much more frequently in women than men, and in persons whose nutrition is defective or who live in damp, malarious, and unhealthy places. It occurs usually between 20 and 40 years of age.

These disturbances are shown externally in three ways: 1st. Intense pallor, temporary in duration, coming on suddenly, with lowering of the temperature, and pain, confined to some local area; the fingers are the most frequently affected, one or more of them; for this reason it has been called "digiti mortui;" it lasts a few minutes, then the pallor lessens, the warmth returns, and the natural appearance is restored; these paroxysms may recur many times in a day. This is the so-called angio-spasm; or the condition may be the reverse, there is an angio-paralysis; a vaso-motor paralysis. Instead of pallor, there is a more or less sudden redness in localized spots, with tingling sensation; it gradually disappears after a few minutes; it may occur in one or both hands.

A number of painful vaso-motor neuroses have been described.

S. Weir Mitchell has related a painful burning condition of the feet, confined to the plantar surface mostly, and in patches; externally the parts look dusky red; it is brought on by long standing or walking; at first there may be a rise in temperature, with later some œdema, swelling, coldness, and pallor in the part; he calls it "erythemomegalalgia." I have observed a somewhat similar painful condition of the feet in a young woman. It is most severe in the feet, but extends as high as the knees; both feet are affected; the pain is sharp and burning, at times very severe; there is a very slight duskiness, no swelling or œdema; the temperature is not lowered. For the past twelve years she has suffered this painful condition during the summer months; she is perfectly free from it during the cold weather of autumn, winter, and spring. The pain is relieved by walking or standing; this is the reverse of Mitchell's case. One is not unfrequently consulted at the clinics and in private practice by sufferers from a painful condition of the hands and arms; it may come on at any time, and is persistent; it is not accompanied by any changes in color or temperature; it is often worse at night, and appears to be influenced by the seasons and external temperature. In marked contrast with the condition of this young woman, who suffers only in the summer, is that of women who only suffer in the winter; in these cases the pain begins in the fingers of both hands on the approach of cold weather, with paroxysms of angio-spasm, which, on subsiding, are succeeded by paralytic dilatation, so that the hands become dark purple, swollen, painful; and ulcerations occur, usually at the ends of the fingers. These ulcerations begin by severe pain in the end of a finger; then there is observed a small black spot —a small hemorrhage—(note the similarity between this condition and the ecchymotic spots in locomotor ataxia) which gradually changes into brown (as the extravasated blood is altered) followed by ulceration with loss of tissue. The hands now become so painful, swollen, and purple that they cannot be used. On the approach of warm weather this condition improves; but there still remains evidence of the ulcerations. The skin of the fingers is glossy, the nails slightly ridged, and the fingers are

of a lower temperature than normal. Both hands are affected, and all the toes to a less degree.

A similar condition, which is still more marked, was first described by Raynaud in 1862, and has since been called Raynaud's disease; symmetrical gangrene; local asphyxia. It may begin in the same way as some of the conditions above mentioned, but this is not usual.

The disease begins somewhat suddenly as a localized pallor; the hands are most frequently affected, then the feet; or it may be more general, when it affects the hands, feet, tip of the nose, and both ears. I have recently seen an extreme case of this kind with Dr. Rich, of this city. The pallor is accompanied with some pain of a tingling, burning character, but it is not severe. This is followed by a dusky appearance of the parts, which gradually deepens, finally becomes black and intensely cold; hence the name symmetrical gangrene given to it. It is usually confined to the first phalanx of the fingers and toes, the tip end of the nose, and the upper part of both ears; its extent varies in each finger; there is great danger of sloughing; the pulse may be feeble; the person looks distressed and anxious; he makes no complaint of discomfort. The manifestations of the vaso-motor neurosis are numerous, but there is a marked general similarity among them.

Prognosis. In some cases it is a most unfavorable condition as far as recovery is concerned; such was the result in Mitchell's cases. In others improvement occurs. The severe cases, symmetrical gangrene, appear to recover more frequently than any others.

Treatment. This must be directed to discover any sources of peripheral irritation, or the presence in the blood of abnormal products, etc.

A great deal has been done in the way of medication, often without satisfactory results. If the general health is poor, a building-up treatment should be adopted: tonics, quinine, arsenic, strychnia, with ample nutritious diet, residence in a healthy dry locality, with out-of-door life, and freedom from anxiety if that be possible. Galvanism to the spine has been used. In severe cases the vascular spasm may be relieved by

belladonna; or chloral may be used to relieve the pain, provided the condition of the heart does not contraindicate its use. The parts should be kept warm with hot dry flannel. If the pulse is feeble, stimulants, or small doses of morphia and digitalis may be given.

Bibliography.—T. A. McBride, New York Medical Record, 1878.—Barlow, London Clinical Society Transactions, 1883.—Chas. K. Mills, American Journal Medical Sciences, 1878.—Allan McL. Hamilton.—S. C. Clark, Medical Record (N. Y.), 1885.—C. L. Dana, Medical Record, 1885.—J. C. Shaw, New York Medical Journal, 1886.—M. A. Starr, Pepper's System of Medicine.

SECTION V.

INSANITY.

CHAPTER I.

The Simple Insanities not Connected with Degenerative Neuropathic States.

It may be well at the beginning of this section to briefly state what are understood by a few of the terms which are in constant use in mental diseases. They are not definitions, but explanations. It is very difficult to define some of these terms to suit everybody. If we understand their application in mental diseases, that will suffice for the present.

Hallucinations of hearing, vision, taste, smell, and tact are quite common in the insane; and the frequency with which they are present is in the order in which they are here given.

Hallucinations are the perception of objects, sounds, tastes, smells, etc., when they do not really exist. If a person says he sees men outside, and there are no men there, he has an hallucination of vision. If he says he hears a child shrieking, when there is no child shrieking, he suffers an hallucination of hearing.

A person may have hallucinations, and yet be sane; mentally he can correct the erroneous perception.

Illusion is the misinterpretation of the character of an object, which is really perceived. If a man sees a piece of clothing hanging on a chair in his room, and says it is a bear, or if, seeing a lamp-post, he says it is a man, he is suffering from an illusion.

Delusions are false ideas, the result of disturbances in reasoning. If a man says he sees men outside his house with guns, when no men with guns are there, he has an hallucination of vision. If now he says, contrary to the evidence of others,

that they are there, that they are coming in to shoot him, he has a delusion based upon his hallucination.

But he may also have these erroneous ideas without the hallucinations; he may, from a general disturbance in his reasoning faculties and vague feelings of distress, say that he has committed some crime (which he is unable to give any evidence of), and is to be hanged to-morrow; he suffers from a delusion.

Imperative conceptions are ideas which are not strictly delusions. The person well knows their absurdity, and can reason about them, but they rise in his consciousness unbidden, and over them he has no control.

Melancholia.

The characteristic of this disease is a profound mental disturbance, varying from simple depression to the most violent despair, with agitation or passive resignation. By the degree in which this depression presents itself, we can recognize a simple, passive, agitated, and attonita variety.

It develops slowly and progressively as the result of disturbances in the physical and mental state, such as prolonged mental emotions, which impair the strength of the nervous system. General disorders of nutrition, the result of gastro-intestinal affections, severe loss of blood, as after parturition, lactation, loss of sleep, painful neuralgias, and more recently *la grippe*, have been, by their depressing influences, causes of this disorder. If these causes act upon a nervous system predisposed to the disease by reason of an inherited or acquired neuropathic state, the resistance is less great than in a healthy nervous organization.

It begins by a general mental depression, forebodings, discouragement, irritability. The patient loses interest in home and family and neglects his work; sleep is poor, appetite fails; women have attacks of crying and grow thin; the bowels are constipated, and the tongue may be coated. This condition may, in the mildest cases, end in simple melancholia. But often patients become restless and sleepless at night; they experience all sorts of uncomfortable sensations in the head; the feeling

of depression increases ; and they have all manner of forebodings and dread. They are unable to account for their condition. If

FIG. 45.



Melancholia. Quiet, but with intense anxiety. (Drawn from a photograph.)

their intellect is sufficiently disturbed, they connect the depression with the idea that they have done wrong, either by committing an unlawful act or neglecting the performance of some service to God or to their children : or some trivial act of their life is recalled, which is judged by them to render them liable to punishment. These thoughts take complete possession of them ; they can think of nothing else. They walk about from place to place, perhaps wringing their hands, and reveal constantly their morbid ideas ; the facial expression becomes anxious and distressed.

They neglect all their duties. Even eating and dressing are

abandoned, and they go about with disordered clothing and hair. They may manifest delusions that they are to be carried to jail or punished in some way for the (supposed) wrongs they have committed. They look out of the windows anxiously

FIG. 46.



Melancholia passive. This attitude is retained day after day; answers are given in a very low tone. (Drawn from a photograph.)

(the least noise attracts them), to see if some one is not coming to carry them off to execution, to the jail, or to an asylum; or they imagine that there is a conspiracy to poison them; or they lament that some calamity is about to happen to their family, or that their property is being taken away from them, etc. They can give no reason for these beliefs. This condition may develop

itself; the delusions may become overpowering, and the intellect be profoundly disturbed. They believe they may be shot; they see persons coming to injure them. Every one who approaches them, they think, is about to do them harm. They have illusions; see in the things about the room and outside the figures of men, hangmen, or men with guns, wild beasts (this is most decided toward the evening, when everything is in shadow). They suspect some danger is concealed behind every nook and corner of the room, and every moment anticipate that some one will come in through the door. They have hallucinations of smell at times, and think they smell blood and dead bodies.

They have hallucinations of hearing, such as the shrieks of persons being killed, their children perhaps; threats of torture; the applying to them of vile names, etc. In this terrified condition they will often rush about, try to get out of the windows and doors, call for help, and attack those about them, especially if, in their confusion, they believe they are about to be injured. Under these circumstances they pay no attention to their appearance, take no food or water, and do not attend to the calls of nature. Often the agitation is so great that it alone prevents them from taking food and drink. If they take water, they hastily swallow a few mouthfuls, looking about them in a suspicious, anxious manner, and then run away; or they may refuse food and drink as the result of delusions of poisoning, or from hallucinations as to the smell of dead bodies, etc. This is the agitated melancholia. All these melancholics may attempt suicide, either to rid the world of their worthless selves, or to avoid the persecutions and tortures which, they think, are about to be inflicted upon them.

In the passive form the reverse of these conditions is seen. Patients are quiet, resigned, and remain in one place and one attitude for days, weeks, or months. The expression shows distress, but not terror, as in the agitated form. If they reply, it is in a low tone and indistinct. Visits of friends make no impression on them. They are annoyed by any effort to change their position, and they resist passively. In the melancholia attonita, consciousness is paralyzed in the highest degree; they

are under the influence of painful impressions; they are stupid, remain in one position, and at night they do not sleep; they place themselves in the most uncomfortable positions; remain in a fixed attitude, with head bent on chest, arms flexed or

FIG. 47.



Annie D., aged 19; decided hereditary history. Hallucinations of hearing, marked agitation, delusions of demoniacal possession. Recovery.

crossed over the chest in a state of profound stupor; they are cold and cyanosed; there are marked nutritive and vascular disturbances; there may be a paralytic œdema of feet and hands, pulse is feeble, secretions are diminished; they lose flesh. It is with difficulty that these patients are made to eat; they have to be dressed and undressed, and put to bed, and they may make much resistance to these efforts to serve them.

A considerable proportion of these cases will recover, but the

prognosis is not so favorable as in mania. Recovery takes place slowly, and there are often periods of exacerbation in the course of convalescence. The person laments less, or his agitation is lessened. Then he begins to take a momentary notice of things about him, then more interest. In some cases it may be from three months to six or nine months before recovery takes place. If he does not recover he passes either into chronic melancholia, or into dementia more or less marked.

Treatment. Must consist in the removal of any diseased condition of the viscera; relief of constipation; a liberal nutritious diet, and wine. With a good deal of patience, persons may be induced to eat sufficiently, and, in the milder cases, even to take medicines, which should consist of tonics, and small doses of opium or morphia, with a moderate amount of exercise out of doors, not enough to produce fatigue. If they remain sleepless, some hypnotic should be given at bedtime. A milk-punch or a glass of ale may sometimes give the desired sleep; or a small dose of camphor in oil, combined with tinct. lupulin, or chloral, urethan, sulphonal, or paraldehyde may be used; the objection to the last is its disagreeable taste, which remains all the next day. In the more agitated cases there is much difficulty in feeding patients, and a stomach-tube may have to be resorted to before they will eat. They will take no medicines; hence small doses of morphia should be given unknown to them in coffee, or, if the agitation be very great, hypodermically.

Mania.

The maniacal state is the reverse of the melancholic; there is an over-activity of all the mental functions; ideas flow with abnormal rapidity; persons conceive all kinds of projects in rapid succession; their physical activity corresponds to their mental exaltation; they are in constant motion; all the perceptions and the memory are keen; they recall readily past occurrences, plunge precipitately from one idea to another, and speak constantly. The facial expression is animated, but rapidly and frequently changes; they are irritable and suspicious; they cannot bear *the least opposition* or contradiction, readily become angry and

violent. They are the victims of their rapidly-changing ideas and impulses. There is a feeling of personal importance. Men organize all sorts of business plans, give contradictory orders, or make plans for enjoyment without regard to expense. They go to excess in wine and women, smoke incessantly, are in constant motion. Women make efforts to display their accomplishments in works, piano-playing, singing, etc. They are self-satisfied; they feel themselves competent to the accomplishment of any project. In mild cases the association of ideas may remain logical, but as they become more and more rapid, abundant, and disorderly, they become confused. The muscular movements also become wild and disorderly. Consciousness becomes clouded; attention and perception are impossible. Illusions and hallucinations may occur, but they are not a part of the ordinary symptomatology, and they play no part in the delirium. They are now in constant motion and gesticulating; they cry, laugh, dance about; lose all sense of decency. The exaggeration of personality may lead them to say they are kings, queens, great actors, musicians, or statesmen.

All the sensations are exalted; light and noise disturb them. They may remove their clothing to relieve themselves of excessive warmth. They appear to suffer no muscular fatigue. In simple cases there is no elevation of temperature; the pulse varies; it may be full and rapid. If the paroxysm lasts long, and they take little food and lose sleep, their weight diminishes rapidly.

The proguosis is very favorable in these simple cases. If recovery does not occur, it is followed by mental enfeeblement—dementia.

Treatment. Allay the nervous irritability. They should be isolated; they should be induced to take plenty of food, if that is possible. Bromide of soda in full doses may be needed to quiet the excitement, and sleep should be procured at night by chloral and morphia, or sulphonal; a dose or two of hyoscyamine at intervals may be necessary. Cold baths may diminish the excitement. If they lose flesh, and the pulse grows weak,

wine should be given with the food. Tepid baths may also be found beneficial.

Senile Dementia.

It is the result of the physical changes in the brain, atheroma, endarteritis, and periarteritis; general disturbances in nutrition, localized atrophies, together with the changes in the other organs found in senility. It may begin at any time after 50 years of age. It begins usually with irritability, which is the expression of defective nutrition of the brain; they become apathetic, suffer a general state of malaise, vertigo, and insomnia. The memory becomes defective for recent events, while they can recall past events. As the condition progresses, they become obstinate and unreasonable, and often suspicious. They may think their house will be broken into by thieves; this makes them very anxious; they take extra precautions in fastening up the windows, and sometimes at an unusually early hour of the evening, or they may believe their goods are being carried away and their families will starve. They become restless at night, get up and wander about at times looking for thieves; in other instances they can give no reason for their wanderings. As the condition progresses they eat freely, forgetting soon afterwards that they have had their meal, and calling for another; or they may go to alcoholic excesses in the same way, forgetting that they have taken a drink, they take another. In spite of this consumption of food they grow thin and haggard, the face pale, and the skin wrinkled and shrivelled. They lose all sense of propriety, make obscene and coarse remarks, or expose their persons, or go about partly dressed, when they had in health been particular as to behavior and dress, or they may make foolish marriages, or assaults upon girls. The general mental state in these persons is that of depression, but there may be exaltation to a moderate degree. As the disease progresses, the defect in memory becomes great; they get lost in their wanderings, forget their house, the names and number of their children. They may suffer apoplectiform seizures, grow more and more feeble; the disposition to wander away may

become very troublesome; it is sometimes done with the idea that they are not in their own house; they may suffer from cystitis, and are liable to have pneumonia. They gradually fail, grow weaker mentally and physically, develop bed sores, perhaps diarrhœa, and die; often Cheyne Stokes respiration appears at the last. Old people sometimes have attacks of ordinary insanity, such as melancholia, mania, etc.; then the mental changes are those found in those states, and are not included under senile dementia. The dementia after cerebral hemorrhage, tumor and other gross brain disease is also not included under this head.

The duration of this condition varies very much; it may be rapid, especially if complications arise, otherwise it lasts from about one to three years.

Treatment can only be palliative. They have to be cared for like children. Some hypnotic may be given them at night, such as urethan, camphor, sulphonal, etc.

Dementia Terminal.

This refers to the mental enfeeblement which is secondary to uncured acute attacks of mental disease. There may be such a profound mental enfeeblement that perception is completely abolished; the facial expression is blank, without a trace of animation even for a moment; they sit in one place all day, with the head down; only take food when it is taken to them, or they to it; then they eat voraciously and carelessly whatever is put before them; they have to be dressed and undressed; they pass their urine and fæces where they are, unless attended to, in the profoundest cases; they make no reply to questions, intelligence is too much impaired to comprehend. In this state of vegetative life they may grow fat. Others can reply "Yes" and "No" to questions, but there is a good deal of uncertainty as to which should be the answer. In others the state of mental impairment is not so great; they can remember fairly well some subjects, and they are able to perform simple acts, which by habit they have learned, and requiring no reflection and judgment. Their association of ideas is defective, all the

sentiments are very much impaired or abolished. Others are restless, walk about constantly, and are annoyed, if disturbed. Often this condition of dementia follows rapidly upon the uncured acute mental disturbance; in others it approaches slowly, being preceded by a state of mental confusion and incoherence. It is sometimes possible to learn the nature of the primary mental disorder from the fragmentary expression of delusions which had previously existed in full force; in others it is impossible to do so without a history.

CHAPTER II.

The Degenerative Insanities.

THE transmission of mental and physical peculiarities from ancestors to descendants is well known, the likeness to parents in face, actions, and bodily shape.

There may also be a transmission of abnormal states mental and physical, or only a predisposition to their development under exciting causes. Hereditary transmission may be direct, so that the descendants present the same abnormal nervous manifestations; as in the transmission of hemicrania, epilepsy, or the same mental disorder. A parent suffering melancholia, a child may have the same, even the same morbid ideas; and these states may arise in the offspring at the same age they did in the ancestors. If the two parents are neuropathic, the transmission is greater. If only one parent is neuropathic, the mother has a greater influence, as a rule, than the father. A suicidal tendency is often transmitted; so that many members of a family may commit suicide. This trait then becomes an evidence of neuropathic transmission; it is said that the influence of the father is most strong in this direction. Numerous instances of transmission can be easily found by any student or physician.

I have met an epileptic man, who by his first wife had one child, a daughter; she became epileptic; he married a second time, and had one child, also a daughter; she became epileptic

at seventeen years of age. The transmissions are not always of the same disease; thus insanity in a family, the descendants may suffer from chorea, epilepsy, or insanity, and these persons are more liable to have general paralysis of the insane than others. Alcoholic excesses in the parents are liable to predispose their descendants to cerebral and other nervous disorders.

In the simple transmission of a neuropathic constitution, the power of the organism to resist disease is diminished but there is no lesion. But the transmission may be associated with evidences of physical or mental degenerations, such as the physical and mental defects of idiots and imbeciles, obliquities in the mental state, imperative conceptions, fanciful ideas, etc. There may be an over-development of one faculty (for mathematics or for music) and the marked enfeeblement of all the others; or there may be deformities of the head, face, mouth, body, hands, or feet, or in the great vessels of the body, etc., or constitutional anæmia, which may play in these families an important part in the nutritional changes in the nervous system and other organs and perhaps explain the associations of phthisis, epilepsy, and insanity in the family and its branches.

The student must refer, for further information on this important and interesting subject, to other works, and first of all to Morel, Traité des Dégénérescences de l'Espèce Humaine, Paris, 1857.—P. Lucas, Traité des Physiologique et Philosophique de l'Hérédité Naturelle.—Ribot, Heredity (translation), D. Appleton & Co., N. Y.: and to other works on insanity given at the end of this book.

Paranoia.

The subjects of this condition inherit a neuropathic constitution, they often have from birth physical abnormalities; in the shape of the head or the body development; they are oversensitive, *eccentric*, and odd; they have strange ideas; they are impelled to absurd acts by imperative conceptions; they are distrustful, given to excesses and *masturbation*. They may go through life without presenting further mental obliquity. In

others at the approach of puberty, or the climacteric, with their disturbing elements, they may develop mental disorder. Or upon excesses of all kinds, privation of food, anxieties, overwork and loss of sleep, they may develop acute delirium, characterized by intense hallucinations. In those cases which develop at puberty, it may be of the type of a mild melancholia or mania, with more or less stupor and confusion, and rapidly pass into dementia. At a later period of life it develops into an active delirium, sensorial in character, with depressed, or exalted ideas. Delirium of persecution, with intense hallucinations of hearing of terrifying nature, from which they may recover more or less suddenly. There is great danger of relapses, and the possibility later of the development of fixed delusions, hallucinations, and illusions.

The chronic form is the most marked, and it usually begins as depression, the result of some mental or physical strain. They become a prey to painful ideas, perplexities, and anxieties; sleep and appetite are lost; they have a vague suspicion that people about them do not wish them well, they desire to get them out of their occupations, or to throw upon them the blame of their errors. As this strained condition of over-sensitiveness increases, they keep to themselves, avoid people, think people in the street are specially observing them; the frequent meeting of a person makes them suspicious of him; they are annoyed and offended by trivial remarks; they think the people passing cough or "suck their teeth" at them so as to annoy. They are the constant prey of painful ideas. They apply to themselves remarks they hear in casual conversation. This continues until at last they believe they are the subject of conspiracy and persecution. They may gradually or suddenly develop hallucinations, hear voices threatening them, calling them vile names; the voices come from all directions, even from their own body. They appeal to the police for protection. May develop the idea that they are the victims of a conspiracy by Jesuits, Freemasons; or that electrical and telephonic machines are in some way made to act upon them. They may have hallucinations of smell and taste; they are poisoned at night by obnoxious gases, and resort to all kinds of strange devices to obtain fresh air; or the food tastes

of dead bodies, arsenic, and other poisons; their drink contains urine, they smell chloroform and stop up the key-holes in consequence. They frequently change their place of residence to avoid these persecutions. Women hear themselves called prostitutes and insulting propositions made to them. They may talk freely, or answer the physician's questions with suspicion; remain in bed and refuse food. They may remain in this condition for months or years. There may be temporary amelioration in the activity of the delusions and hallucinations, with relapses. Change of residence often gives rise to these improvements, but soon these delusions are as strong as ever; they think their enemies have discovered them. The ideas may very soon become fixed and systematized.

They may have disturbances of cutaneous sensibility, think animals are in their bodies, sexual liberties are taken with them at night, their viscera are displaced or drawn up. They may have delusions of poisoning, when they refuse food, but will live on raw eggs, or cook their own food. Hallucinations of vision are rare. The delusions here are like those in melancholia, but they differ, in that the person seeks for an explanation of his distressed mental state in the external world or his surroundings, and concludes that he is the victim of a conspiracy; while in melancholia he finds in himself the explanation of his feelings; it is a punishment upon him for his crimes and misdeeds. At first they endure passively their persecutions, but later they become defiant, threaten their supposed persecutors, appeal to the court and police for protection and redress; finding no help they become aggressive, and are then exceedingly dangerous; they may on the least suspicion take the life of any one around them, or perform some brutal act often with the idea of calling public attention to their persecutions, and thus obtain redress. They never murder secretly, but openly. They may pass into a state of physical weakness, or there may occur a change in the delirium. They think they notice they are observed, and are the special object of attention and respect by great personages, actors, actresses, statesmen, etc., as they pass them by. The newspapers hint at their noble birth; they are the son or daughter of a king, a large fortune awaits them; or they are very

learned, poets and writers, great inventors, or have a wonderful theory, or they are the suitors of some person of distinction (Dougherty thought he was the suitor of Mary Anderson; when confined in an asylum he shot an assistant physician, having included among his persecutors the officers of the institution); or they travel from a distant city to have an interview with a

FIG. 48.



Paranoia, delirium of grandeur. Says she is "Queen of Heaven." Dresses (as shown) with a crown made of pasteboard, decorated with feathers, beads, paper, and ribbon. (Drawn from a photograph.)

young lady of wealth they never saw. At this stage the whole attitude and manner show the exalted ideas. In others the ideas of grandeur are expressed in a feeble manner; they are queen of heaven, etc., the Messiah, Son of God.

The delirium of grandeur developed explains to them the cause of their persecution; it was to deprive them of their inheritance or to prevent their marriage.

These chronic cases are incurable; they undergo a certain mental enfeeblement, but there is no tendency to dementia; when confined in an asylum they live for years, comparatively contented.

Hysterical Insanity.

The hysterical temperament is its foundation, it is very variable. There is an extreme change of state; it is much influenced by disturbed conditions of the sexual apparatus, feebleness, physical and psychological; the reflexes are overactive; they are thrown into convulsive states with great ease; they are emotional and imaginative; impressionable; there are often sudden intellectual confusion and incoherent ideas; they are fond of being eccentric and attracting attention; their behavior is such as they think most calculated to make them interesting. They are egotistic; they neglect their own occupations to engage in useless benevolent work. Others are disagreeable, quarrel with their friends and abuse their families so that they cannot live at home. They are subject to intense hallucinations of a fanciful character. They have either excessively strong sexual desires or the reverse, and are sometimes given to self-abuse. They exaggerate their pains, and accuse those about them of unkindness; they pretend resignation to their state. They are usually unfavorable cases for recovery.

Periodic Insanities.

They are evidence of hereditary transmission of a neuropathic state. They are characterized by the periodic recurrence of their attacks: Periodic mania, periodic melancholia, and circular insanity.

Periodic Mania is in some respects very similar to ordinary mania; it is often preceded by a state of irritability, quarrel-

someness, and dissatisfaction, depression, disagreeable sensations. They may go to excess in drinking, etc., abuse their families and those about them ; the attacks may begin early in life or at the climacteric. In a more decided way they become quite violent, and break and destroy things about them. In a few days it may subside ; the onset of these attacks is more apt to be sudden than in the simple mania and melancholia. Others may have religious ideas or think they have enemies about them, and suffer from hallucinations, and more or less complete mental confusion ; they have sudden attacks of destroying everything about them. They may express ambitious ideas ; be haughty, but confused in their ideas ; it is possible sometimes to gain their attention for a few seconds. The facial expression is animated, there is constant confused talking ; in the absence of confusion they may accuse those about them of injustice, and make complaints. They cannot remain quiet a moment, move from place to place, make all sorts of gestures, destroy things about them, pick the plaster away from the walls, tear up all their clothing until they are naked, may expose themselves with evident sexual excitement. Others make curious braids and ornaments with the pieces of torn clothing and bedding, which they tie around their head and waist ; stick feathers or whisks of broom in their hair. They may use vile language ; sing and shout night and day. The duration of these attacks varies from a few days to several weeks ; it usually ceases gradually with at times slight relapses for several days or weeks before the quiet interval is established. The time of interval between the attacks varies. Mentally they are not normal, often presenting a number of pathological traits which they showed in an aggravated form during the maniacal seizure. Usually these attacks are exactly alike.

PERIODIC MELANCHOLIA is, like the melancholia, observed in a healthy brain, but its onset is sudden, like periodic mania, and it passes away more or less rapidly.

CIRCULAR INSANITY.—Its characteristics are alternating attacks of mania and melancholia, or melancholia and mania.

The mania is like the mild mania of common type—a state of over-activity and excitation, mentally and physically. They are constantly occupied with some project or business scheme. They are egotistic, fault-finding, make complaints against the authorities, or the officers of institutions; annoy and irritate those about them, then threaten them; move about constantly, engage in (if allowed to do so) first one business, then in another, without any regard to their fitness for its prosecution, means to carry it on, or prospect of profit. One patient whom I have seen wrote letters to large business houses ordering large quantities of merchandise of various kinds; they spend money recklessly, go to excess in drinking, etc.; they have exalted ideas of their own importance, and not unfrequently hypochondriacal ideas, but they are not expressed in a gloomy way. They think they have kidney or heart disease, and wish to be examined; they write constantly long essays or letters, or they draw all kinds of figures and designs, which they show with satisfaction, as remarkably well done—perhaps designs for mansions and stables they intend to erect. These are always curious and grotesque. Women are coquettish, and try to make a display of accomplishments they do not possess. They talk and move about incessantly.

The melancholic stage is of the type of common melancholia. The passive form is the most frequent. They become quiet, avoid people, keep the house, have a dread that something will happen to them. Hallucinations are rare, but they may have delusions that they are to be carried away; they speak less and less; the facial expression becomes apathetic and dull; if they speak, it is in a low tone; they remain in one position, with head and eyes down; they may refuse to eat, and have to be urged; they may go to bed on the appearance of this stage, and remain there during its continuance. They are apathetic, dull, and stupid; they cannot be induced to get up. During this stage they lose flesh, if the refusal to eat is marked; the secretions are diminished, the bowels constipated, circulation impaired, hands and feet cold and blue, pulse small.

In the maniacal state this is just reversed; all the functions are active; they eat heartily, grow stout, circulation and secretions active.

The most common type is the melancholia followed by the mania; the passage from one state to the other may be sudden or gradual, without any interval; the duration of each phase of this cycle varies; it may be as short as a day, or it may last several months. Often the duration of each phase is alike, say melancholia six months, mania six months; but it may be unlike, as in the case of a girl under my care, in which the melancholic stupor lasted a year, and the maniacal stage three or four months. After the cycle has been run, there may be an interval of apparent mental health; but it is more common to have that interval a shading off of one or other of the phases. As the condition becomes more pronounced, they pass from one cycle to the other for the rest of their lives. The diagnosis rests in these cases upon the history, or observation of periodicity.

Epileptic Insanity.

The epileptic state has already been described. Insanity may follow the epileptic convulsion—post-epileptic insanity. It may precede the convulsive seizure. It may take the place of the convulsive seizure, or it may terminate in dementia.

After one or more epileptic seizures, there may be a sleep of short duration, which may be followed by a state of light stupor, during which, or following it, there is a state of fright and terror with disturbance of consciousness more or less complete. The stupor may be prolonged for days; it may be deep, or only a confused dazed state in which they mutter to themselves, repeat words or sentences, move about from side to side in a restless manner. They may be constantly asking questions and making complaints or demands. They have difficulty in speaking, which is indistinct and hesitating; their movements may be slow, awkward, and trembling. Consciousness is profoundly disturbed. After the attack has subsided, they may indistinctly and in a fragmentary manner recall certain things which have occurred. Or there may be a state of anxiety, irritability, and excitement (post-epileptic delirium), the result of hallucinations of a terrifying nature. They are thrown into a state of wild ex-

citement and fury, in which they break objects; injure themselves and others; the face is congested, eyes and conjunctiva injected, facial expression that of terror and fury, eyes more or less fixed and wild; arteries throb. At the end of a few hours or a few days they quiet down gradually, sleep; after which there is a light state of stupor or confusion. They complain of headache, feeling bad and tired; during the excitement they neither eat nor drink; now they begin to take food. The hallucinations are terrifying: they see God, the heavens opening, angels and devils, hear music, or terrifying noises. The violence is sudden and furious, and directed against persons and objects around them, with indifference; a parent kills his child by suddenly dashing it against the wall (a case which came under my personal observation). They may mutilate themselves. In other cases the maniacal seizure may precede the convulsion; they are irritable, strange, restless, asking innumerable questions, and making demands, become more and more agitated; this is followed by a convulsive seizure, after which they may pass into a sleep, followed by a confused state, and recovery of their former selves, or, after the convulsion, there may be the wild excited state, as in cases of post-epileptic delirium. Or the convulsive seizure may be replaced by a maniacal attack similar to the post-epileptic delirium; they may have all the terrifying hallucinations, or not; they sing, shout, break up every thing about them. A very marked illustration of this condition has come under my observation in a young mulatto. The paroxysm was ushered in suddenly with extreme violence; he would break everything about him, sing at the top of his voice, eyes more or less fixed, facial expression rigid, as if the muscles were in a state of tension; but there was no look of terror; his songs were those familiar to us; this excitement and singing he would continue night and day.

There may be maniacal attacks which last weeks and months with marked disturbances of consciousness, illusions, and hallucinations of a distressing character, marked ill-temper, fault-finding, with religious ideas, a disposition to acts of violence, and a tendency to end in dementia.

There are also seizures more or less sudden (and these are

not succeeded by convulsion), in which the person is seized with dread, terrifying ideas, a dazed state of consciousness, with impulses to suicide, or acts of violence to others, and there is a disposition to wander away from his residence; it is of short duration—a few days.

There are also seizures, very much like *petit mal*, in which there is sudden and temporary confusion, disturbed consciousness, during which they perform apparently voluntary motor acts (automatic acts), such as attempts at suicide, or homicide, thefts, setting fire to places, rape, etc. There is complete amnesia. They are of short duration.

During the convulsive seizures there is elevation of temperature and increased pulse-rate.

Epileptics are often profoundly egotistic; they think only of themselves, and observe minutely all the acts of their vegetative life; they are indifferent to those about them; they are irritable, easily offended, and the least opposition to their wishes gives rise to vague ideas of persecution. On the other hand, they are often easily made sociable and pleased by small attentions and acts of kindness or a few kindly words. They are frequently excessively religious, speak only of God and religion, sing hymns, and read the Bible. This excessive religious feeling may precede a maniacal attack. They are often defiant, quarrelsome, and fault-finding. In the majority of these cases they gradually pass into a state of dementia.

Treatment. These epileptic insanities are best treated in asylums. In the maniacal attacks it is necessary to isolate them; if the maniacal excitement is prolonged, so as to cause exhaustion, narcotics must be given—chloral is the best. The treatment otherwise is the same as epilepsy, but usually less successful. In the maniacal seizures, which replace the convulsive attacks, the best results are sometimes derived from the use of full doses of bromide of soda or potassa.

Alcoholic Insanity.

There is a peculiar neuropathic state which in some persons gives rise to a craving for stimulants, and especially alcohol—

such as the dipsomaniac, who periodically is impelled to take his first drink, and then suddenly plunges into the depths of alcoholic intoxication, to emerge from it somewhat quickly after several days or months, with a period of freedom and abstinence, or in the case of a person whose whole character is irritable, disagreeable, a burden to himself and those about him, an increase in this irritable state precedes an imperative desire to drink. But all patients are not of this type, but may be individuals who with inducements have acquired a habit of drinking for years, have thus lowered the tone of their nervous organization, weakened their will power, so that they no longer control themselves. Their organs are all more or less diseased; fatty changes, increase of connective tissue, especially in the liver and kidneys, have occurred. There is no relation between the amount of alcohol taken and the mental symptoms; as persons with a neuropathic constitution bear alcohol very badly; and a comparatively small quantity taken by them will set up a train of morbid mental symptoms not found in others.

After a few days or weeks of alcoholic excess, hallucinations, delusions, and illusions of a terrifying character are developed; voices threaten and taunt them. Delusions that he is to be killed or injured by these men; thinks he sees these men coming after him; at night he hears multitudes of threatening voices of men and devils outside his house trying to get in; he has illusions, in that he mistakes the lamp-posts for men with guns, or a wagon for a hearse to put him in; the objects in the room may be mistaken for men, or he may have vivid hallucinations of vision, seeing numbers of men outside. He becomes intensely terrified; either shouts for help, or attempts to hide, or prepares to defend himself. Such a man is dangerous. In one case which I have seen, the man had hallucinations of vision; he saw the floors, walls, and the bodies of those about him covered with long, sharp, steel spikes, which they intended to thrust into him; in his terror he drew a pocket-knife and stabbed a man near him; or he may believe the world is coming to an end, see angels and the devil.

Others are depressed; think they are about to die; hear voices calling them vile names; in women, accusations of pros-

titution; threats to kill them, or turn them out of their houses; or the delusion that they have some loathsome disease. They have a marked tendency to injure themselves by mutilation; sometimes the most terrible, such as putting their heads in a hot stove, or burning themselves over the abdomen and penis with hot coals, which are drawn from a fire with the hands, or hammering off the penis; another makes efforts to gouge out his eyes; hanging and strangulation are also attempted. These terrifying ideas are greatest at night; they are sleepless, and may refuse food under the idea that it is poisoned. They lose weight, look pale; pulse rapid and irregular, running up during a period of intense terror; tongue coated, breath offensive. Rarely, there may be epileptic seizures; or the delirium may not be so active; but there is a decided delusion of persecution, with hallucinations of hearing; they hear persons calling them vile names and accusing them of crimes, using blasphemous phrases; they may develop delusions of marital infidelity; these delusions are almost characteristic of alcoholic insanity, and its subjects are dangerous individuals. In others there may be an hallucinatory stupor, with restlessness, which may entirely subside in a few days.

There may be a gradual mental enfeeblement, a dementia, with defective memory for recent events. There may be sensory disturbances in these cases, depending upon neuritis. (See Alcoholic Neuritis.)

In the more acute cases the prognosis is always favorable. If there is a gradual and steady mental enfeeblement, recovery is only partial; if the alcoholic excesses are continued, there is ultimately complete mental enfeeblement. There may be an apparent dementia, from which they may recover partially or entirely.

Treatment. Must be abstinence from alcohol. In the acute conditions it may be necessary to give morphia to quiet the terrifying hallucinations; chloral may have to be given to procure sleep. It may be necessary to give hyoscyamine or hyoscine; it should be given once and under the physician's direction, and not repeated without his seeing the patient again. As much

food should be given as they can be induced to take. The secretions should be kept active.

Imperative Conceptions.

Under this head is included a variety of abnormal mental states. The sufferers from it may be insane, but most commonly they are not; they reason and think correctly, recognize the absurdity of their ideas, and often occupy important positions in life. They are most frequently met with in private practice or at the clinics. It is characterized by a sudden bursting into consciousness of ideas or words which have no connection with the existing train of thought; it surprises, confuses, and distresses; it is beyond the control of the individual; no effort prevents the sudden appearance of these morbid ideas. They are not unfrequently connected with the curious and fanciful ideas of the person. It is always found in persons of a neuropathic inheritance, and there may or may not be evidences of degeneration. One of my patients always felt an irresistible desire to tell persons he saw to do some harm; if he saw a child, to tell it to break things or set the place on fire. Ruffianly-looking men gave rise to the desire to tell them to kill or do some harm. These imperative conceptions are often associated with a feeling of doubt as to their having performed some act; this man often doubted if he had told these persons to do harm; with difficulty he freed himself from the impression that he had. Under this general head have been described a variety of morbid states, such as *folie du doute*, *folie du toucher*, mysophobia (fear of contamination) of Hammond, agarophobia, claustrophobia, etc.

In its simplest form this condition is sometimes observed in neurasthenics, and, perhaps, women suffer from it oftener than men; it occurs in persons who inherit a neuropathic constitution, who have evidences of degeneration; but it may be found in persons who present no evidence of degeneration. It is brought on by illness, which lowers the general nutrition, loss of blood, anxiety, privations; gastro-intestinal disorders play an important part in setting it up. The disorders of the intestinal tract have a most wonderful influence in disturbing the nervous

systems of these persons. In its simplest form it is manifested by a dread of fatal disease which they doubt their physician's knowledge of, or they doubt the propriety of his treatment. They watch with anxiety all their functions and sensations, interrogate their physician and friends. It is constantly manifested by a dread of going out of doors alone; they fear they will fall in the street, or have some kind of an attack, or that something will happen to them, they cannot explain what. The moment they attempt to go out this imperative idea comes upon them; they become anxious, tremble, perspiration breaks out; they are flushed, feel hot, and faint; a feeling of suffocation and weakness of the legs comes over them. They are conscious of the absurdity of the idea; many try to overcome it by going out; in others the idea and dread are so strong, that the moment they attempt to go out, this idea, with all its accompanying sensations, comes upon them. Others have a dread of crossing the river or travelling on a railroad train; an idea comes to them that something will happen, when they are at once thrown into terror; one of my patients always said he became "panicky." Cold perspiration would break out upon him; he was in terror until off the car; he knew the absurdity of the idea and dread, but could not overcome them. Or a woman may have the idea that the needles she uses will do some harm. A painter fears that in some way he has poisoned a well. These imperative ideas may be of a homicidal nature. A young girl, at the sight of knives, has an imperative conception to kill her mother; she is perfectly conscious that it would be unnatural and a crime; she tries to overcome it, but is unable; this throws her into a state of distress and anxiety, in which she cries and begs to be helped.

Or the imperative ideas may take the form of questioning on religious and metaphysical subjects, such as "Who am I?" "Who is God?" "What am I doing here?" "Am I alive?" etc. Or they may be of a vulgar character, and these are frequently associated with religion. In devotions the idea of the sexual apparatus of the Virgin Mary suddenly arises and constantly recurs. To a good Roman Catholic this is a most terrible thought. He tries to overcome it, consults his priest; but

the idea constantly recurs in spite of his efforts. I have met a number of cases with this idea. Or it may take the form of curses on the Virgin Mary and God. One of my patients constantly had "blasphemous thoughts" about God; if he spat upon the floor, he thought he had spat upon God. These ideas were to him sins. The result was he at once prayed for forgiveness wherever he was, on a street or public conveyance; and as the imperative ideas recurred very frequently he was most of the time praying. A well-marked form of this state is the mysophobia (*folie du doute; folie du toucher*). It usually begins, in a well-marked case, with doubt as to their having performed some act properly; this is soon followed by a dread of dirt, contamination. A characteristic of these cases is frequent washing of the hands, with the imperative idea they are dirty. Once washed they doubt their being clean; this leads to another washing and repetitions. In one of my cases the mother suffered imperative conceptions when young. The child was peculiar from birth; cried constantly, was irritable, slept little. Early in life had whooping-cough, during which there were frequent convulsions; later, a severe attack of chorea. As a child, was peculiar in eating; never asked for sweet things, preferred salt; ate at irregular times. After leaving school engaged in a business, when his first decided symptoms began. His hands became dirty from the dust and his work. This induced him to wash them; but they still felt dirty, so he washed again, and it soon became a frequent operation, as he had constantly recurring doubts as to their cleanliness. At about the same time, after arranging articles about the store, he doubted his having arranged them properly and had to return. The sight of the objects did not satisfy him that they were properly placed; the imperative conception was so strong that he had to rearrange them. This desire to wash the hands became stronger and more frequent. Soon other imperative conceptions were added: the chairs upon which his parents sat he thought dirty and would not use them; the door-knobs were dreaded, he avoided touching doors and knobs, abandoned using a night-key, had a special dread of the bath-room door, also the baluster of the stair; this caused him to assume a peculiar attitude when going

down or up stairs, so as to avoid touching the baluster on one side and the wall on the other. At night he spent hours getting ready for bed, frequently washing the hands, arranging and rearranging the articles about the room. All these dreads turned upon the idea of contamination. Now he began to have an imperative idea that he must roll up his night-clothes eleven times before he could put them on; all this was repeated in the morning. In others there is an idea of poison getting on them, or that the knives are dirty; food cut with them is unclean, and in consequence there is refusal of food cut with knives. One little boy I have seen thought by touching objects and people he would get "blood poisoning." The dread of door-knobs, knives, objects made of metal, is very common with these sufferers. They are perfectly conscious of the abnormality in their mental states, but are powerless; all their endeavors to correct these conceptions are ineffectual; they only become confused, suffer headache, and are thrown into such a state of anxiety they usually abandon all efforts and resign themselves to their fate.

Another class of cases, not frequently met with, however, are the sufferers from perverted sexual instincts. It is an anomalous sexual state in which men are attracted sexually towards men, and women towards women. It is an imperative impulse; it occupies the thought of the individual; they recognize their abnormal state and often lament it, while others defend their actions and perverted feelings. They have no pleasure in the association with those of the opposite sex. They may be unable to have sexual intercourse; if they can, it is not accompanied with any gratification. They have erections only in the presence of men. They may gratify their perverted instinct by contact with the object of their love, or by mutual onanism, or by sodomy, but this is rare. They take great pleasure in watching the naked forms of their own sex.

They may have all the appearance of normal individuals. Others have a feminine appearance, when they are really men; are fond of puerilities, of things which interest women, have a special aptitude for millinery, etc. The relation of the history of one of these individuals will best illustrate the condition; it

is reported by Krueg. N. belonged to a neuropathic family; his mother was hysterical, a sister similarly affected, and a brother shot himself. When six years of age the sight of naked men in a bath gave him peculiar pleasure. From nine to fourteen years was nervous, the result of a fright, and was sent into the country on account of his delicate health. Learned the practice of onanism from his school-fellows. At this time conceived an extravagant fondness for one of his "friends," in which, at last, sexual desire and jealousy came to play the same part that they ordinarily do in love affairs. Found no pleasure in the sports of his comrades. Later, devoted himself successfully to millinery; ladies' bonnets were his particular specialty, and he possessed singular taste in designing new shapes and trimmings. Was thirty-three years of age, in good pecuniary circumstances, had no desire to marry or have children. Had an insuperable abhorrence of sexual connection with women. Continued to practice onanism alone and with other men. Confirmed the statement made by others that individuals affected with this abnormity are able to recognize one another. His imagination would dwell on the male sex only, although he did all that he could to direct it to the opposite sex. Men appeared to him in his dreams. He resolved to leave off all intercourse with men, but since the resolve had experienced a constantly increasing mental irritation, as he could not gratify his stronger sexual appetite. Complained of various nervous sensations; had inherited the fear which his mother had of anything pointed, such as pins. At times lost the power of controlling his thoughts; was unable to banish certain ideas (Zwangvorstellung). For instance, during the mass for his dead brother was compelled to think of a combination of the Host and the anus of a dog – a horrifying thought to a believing Catholic like himself. Patient was of medium size, with normal genital organs, a sparing growth of beard carefully shaven, affected in dress and demeanor; speech and gestures theatrical.

The clinical picture in these cases of perverted sexual instinct is exceedingly varied and curious. Krafft Ebing, one of the best writers on this state, summarizes the subject in the following manner:—

a. Congenital absence of sexual feeling towards the opposite sex, at times even disgust of sexual intercourse.

b. This defect occurs in a physically completely differentiated sexual type and normal development of the sexual organs.

c. Absence of the psychical qualities corresponding to the anatomical sexual type, but the feelings, thoughts, and actions of a perverted sexual instinct.

d. Abnormally early appearance of sexual desire.

e. Painful consciousness of the perverted sexual desire.

f. Sexual desire toward the same sex.

g. The sexual desire remains purely platonic or finds gratification in mutual onanism or in feeling of the object of the affections. Often there is self-pollution, but for the want of something better. (Archiv. f. Psychiatrie, B. VII.)

For further information on this subject refer to J. C. Shaw and G. N. Ferris, Perverted Sexual Instinct, Journal of Nervous and Mental Disease, 1883, where a summary of cases is given and one by the authors.—Blumer, G. A., American Journal of Insanity, 1882.—Tarnowsky, Die Krankhaften Erscheinungen des Geschlechtssinnes, 1886. This monograph has a complete list of references to date.

Hypochondria.

It is always developed in those who have a predisposition, by inheritance, to mental and nervous disorders. It is most commonly seen after forty years of age, but may begin earlier; it is usually brought on by some condition which lowers or disturbs the health; it may be associated with the occurrence of the menopause or from excessive mental anxiety. The functions become disordered in consequence of this disturbance of their nerve innervation; disorders of digestion arise, food is digested or assimilated slowly; there are neuralgic-like pains and other abnormal sensations in the stomach and intestines; less and less food is taken, it causes distress. Constipation arises, sleep is imperfect; soon the ideas become painful and anxious; they fix their attention on these morbid sensations and the functions of the body; the abdomen and genital apparatus are frequently

the parts upon which their attention centres; they exaggerate all their conditions. They express fear that they are suffering from some serious disease of the stomach; it is cancerous, or its secretions are all dried up, or it is displaced so that the food cannot get into it. Under these delusions they eat less and less, or they think the intestines are closed, or they cannot swallow, or their bodies are wasting, and their brains are undergoing a process of decay. Their friends and physicians have no knowledge of the gravity of their condition, and here one finds often a tinge of egotism or exalted ideas of their superior knowledge; they know their true condition, no one else does, or they announce that there never was a case like theirs. Some of them are fond of recounting their morbid sensations and ideas over and over again, for they can think of nothing else; while others remain passive, resist every effort to induce them to eat or dress; they may scream or become agitated if urged too closely to eat. Often if food is left within their reach they will eat it, at the same time protesting their inability to take food. They will often resist the calls of nature, protesting that their bowels are closed, until, unable to resist longer, they pass their excrements in their clothing. They are never able to correct their erroneous impressions and ideas, their will-power is weakened, but on subjects unconnected with their physical condition they reason as correctly and keenly as formerly; others are passive, do not wish to consult a physician, they are hopelessly diseased and must soon die. Their moral nature is perverted, they make every effort apparently to convince their family of the correctness of their views, render themselves disagreeable and exacting, pour out all manner of forebodings and predictions of a disagreeable character, make pretence of great suffering apparently to give anxiety to their friends.

It is always a chronic condition; it begins slowly and progresses slowly; it may have remissions; later, it becomes confirmed, or it may have added to it a true melancholia, or have engrafted upon it a systematized delirium.

Prognosis. Is not favorable in these cases.

Treatment. Efforts should be made to build up the nutrition by enforced feeding; tonics can be given, and allay if possible the

morbid irritability. Morphia is of some service here. Often, medication is useless.

General Paralysis of the Insane.

(Progressive Paresis, Dementia Paralytica.)

This is a chronic disease of the brain, characterized by marked mental enfeeblement, with grandiose, hypochondriacal, or melancholic delirium.

Etiology. This appears not to be clearly determined; it is very frequently seen in persons of neuropathic inheritance; excesses of all kinds, in alcoholic drink, venery, excessive mental strain, and anxieties in business, late hours, and excessive eating. The changes brought about by syphilitic poison are undoubtedly a frequent cause.

Symptoms. As prodromal symptoms, found in many cases, are marked changes in the disposition and character; they become irritable and fault-finding, especially at home, quarrel with their wives and children without cause; neglect their work, make mistakes in their business, are careless; formerly of exemplary character, they now begin to drink freely, are over-active, but in a careless, disorderly manner, going from one subject to the other, without the least effort to accomplish any thing they undertake; they may associate with fast women, upon whom they spend large sums of money. They complain of fulness and pain in the head, vertigo, and insomnia. After this prodromal stage the delirium may be extravagant, hypochondriacal, or melancholic; or there may be a passive, self-satisfied state. There may be a sudden or gradual development of grandiose ideas; they become very active, sanguine to the extreme about their business prospects, anticipate the making of large sums of money; talk incessantly of business enterprises, one after the other, and usually of immense extent, requiring for their development very large sums of money. The absurdity of these plans, and the bringing in of collateral plans of the most ridiculous kind are evidence of their mental weakness; the weakened memory is marked by their forgetting the detail of their plan as first

stated ; or they may, as one of my patients did (who was a book-keeper), start unbidden to establish a branch-house in a neighboring city, where he became confused, lost himself in the street, was taken up by the police ; on his way back to New York he lost his way in Jersey City and wandered about for many hours. Or they are suddenly plunged into a maniacal state, talking incessantly, passing from one extravagant statement to another without any connection ; are in constant physical activity ; there may be a decided mental confusion ; they may tear and break things about them. Others are moderately quiet and happy in their ideas of wealth ; if they are unrestrained, they spend large sums of money, buy horses and carriages, gloves, umbrellas, in large numbers, or spend their money on useless trifles ; or in their activity they may paint their houses inside with whitewash, or in the most fantastic colors. They may pick up pieces of coal, wood, stones, and rubbish, say they are diamonds, gold, or valuable articles, and put them away carefully. The sexual desire is often much exaggerated at this period. They wander from one extravagant idea and act to another ; their variety is innumerable. Instead of the ambitious delirium there may be hypochondriacal ideas, or melancholic ; they are depressed, say their teeth are lost, something is wrong with their eyes, arms, or mouth ; complain of pain in various parts of the body ; show what they take to be changes in their skin and hands ; are very emotional ; cry without cause. They are often conscious of their condition. There may also be a mild delirium of persecution ; they think people are following them, or watching them. This delirium may continue until dementia is extreme, or it may be replaced by extravagant ideas, or there may be mild ambitious ideas associated with it. Another form is the delirium of satisfaction ; the person feels perfectly well ; never was better in his life ; is satisfied and contented even with the plainest food and housing ; is quiet, gives expression to no ideas or wants. The defect in memory increases ; they lose themselves, forget the ordinary occurrences in their daily life.

The physical symptoms which often appear early are difficulty in speech, it is thick and hesitating ; they are unable to pro-

nounce words distinctly; this is much greater if the person is agitated or angry; the lips and facial muscles tremble. The pupils are contracted or irregular, or one is larger than the other; their reaction to light may be diminished or lost. There may occur at any time during the course of the disease epileptiform and apoplectiform seizures. The epileptiform attacks may begin with localized twitchings of the muscles of the face or one hand, and gradually extend into a generalized convulsion; with all the features of epilepsy—during which the temperature runs very high. There may be a series of these convulsions similar to those found in status epilepticus; during these attacks the person may die; or the convulsions may cease, leaving him very stupid, and perhaps paralyzed on one side. This stupor and paralysis usually pass away; the person is always worse after these attacks; it can be observed that he is weaker and more feeble mentally; it is possible to have a lasting hemiplegia in these cases. Apoplectiform seizures occur in which there are no convulsions; they suddenly become rigid, stupid, pass urine on themselves; in a short time they recover, but are stupid and dull, with more or less marked hemiplegia, which gradually disappears. The tendon reflex may be present, absent, or exaggerated. As the disease progresses, they become more and more feeble, mentally and physically. The urine may dribble away. They eat voraciously whatever is set before them; taste is evidently very much diminished; they are at this stage in danger of choking themselves by trying to swallow too large pieces of food. They may grow very stout, exceptionally thin and cadaveric. Trophic disorders appear. The bones may undergo changes similar to that found in locomotor ataxia. Ulcerations of the skin and paralytic œdema are present. If they are not cut off by convulsions the mental enfeeblement becomes extreme; physically, they become too feeble to move about, and are consequently confined to bed; diarrhœa, extensive bed-sores, and ulcerations of the soft parts of the heel and toes occur, and they die of exhaustion or diarrhœa.

At any time during the early course of the disease there may be an entire subsidence of the delirium, and disappearance of the physical symptoms; the person is apparently recovered; he

expresses no longer his extravagant ideas, behaves rationally, and returns to his business, which if comparatively simple he may perform without difficulty. This subsidence of the symptoms is known as a "remission;" it may last from a few months to one year, when the person again presents all the physical and mental symptoms as at the beginning, and the disease runs its course to death.

General paralysis occurs in women, but it is much less frequent; in my experience it occurs between 30 and 45 years of age; it has evidently the same causes as in men. The marked delirium of extravagance is seen among women, but very much less frequently than in men, and their ideas are of diamonds, dresses, their personal appearance, or the number of their children; as a rule the delirium is of a quieter kind; they are satisfied; occasionally they may express an extravagant idea, it is then usually in regard to dress or personal appearance; a woman suddenly puts out her foot and asks if it is not a pretty foot, or she picks up the skirt of her dress and asks if her underskirt is not beautiful. They may have the hypochondriacal and melancholic ideas. The disease comes on and progresses more slowly than it does in men. They may have all the other symptoms.

Prognosis. Is unfavorable, the duration varies; they may live two, three, or four years, exceptionally longer.

Pathological Anatomy. Marked thickening of the pia mater with whitish streaks, especially along the vessels; the pia is adherent in places to the cortex; the vessels are tortuous and distended; the changes are most marked over the frontal lobes and the convolutions about the fissure of Rolando; there is more or less atrophy of the convolutions, with spots in which the atrophy is more extensive; here there may be found considerable œdema of the pia mater. The occipital lobes are usually healthy. The ventricles may be distended with fluid; the ependyma is granular.

Histologically, the vessels are tortuous and enlarged. With aneurismal dilatations, the nuclei in their walls are increased, especially at their bifurcations, with fatty and colloid degenerations of their walls. The perivascular spaces are distended and contain leucocytes and pigment granules. There is marked

evidence of hyperæmia in the deep layers of the cortex and basal ganglia. The nerve-fibres have disappeared, and there is an increase in the neuroglia with a profusion of spider-cells. The nerve-cells have undergone all degrees of fatty and pigmentary degeneration. In the spinal cord there is more or less extensive change; sclerosis in the posterior columns; degeneration in the lateral columns, or more diffused lesions. This condition is often spoken of as chronic diffuse meningo-encephalitis, implying an inflammatory origin. Opinion differs on this point.

Treatment. There is no treatment which cures this disease. The excitement is lessened by the use of ergot and bromide of soda or potassa. In those cases where there is a clear history of syphilis, iodide of potassa in increasing doses, as is given in syphilitic nervous diseases, produces no effect whatever in this disease. Counter-irritation of the scalp with tartar emetic ointment gives some temporary relief to the headache and fulness, but it is a very painful application. Very recently trephining has been tried, but it is not at all likely that it will be of much service, and the indications for its use are exceedingly vague. Quite a large proportion of these cases have to be removed to asylums, others are quiet and are kept at home.

Imbecility and Idiocy.

An arrest of cerebral development, either in utero or after birth, and in consequence, entire absence or enfeeblement of the mental processes.

These two names indicate the degree of mental weakness; it is greatest in the idiot; the extent of mental weakness varies very much.

Etiology. Hereditary plays an important and large part in its causation; consanguineous marriages; scrofula; anything which very materially affects the nutrition and general health of the mother may cause it; injuries, great anxiety, or fright may also be causes. Drunkenness in the parents. It may be the result of some cerebral disease coming on in the first period

of life, or injuries at that age; falls may cause it, by the injury done to the brain. (See Spastic Hemiplegia in Children.)

Symptoms. Numerous classifications have been made of idiots and imbeciles. Ireland described the genetous form which is the result of intrauterine disturbances; these children are defective when they are born; he thinks the enlarged glands, abscesses, skin eruptions, etc., from which they suffer, point to scrofula as a cause. Two-thirds ($\frac{2}{3}$) of them he says die of consumption; physically, they are feeble, with impaired circulation, low temperature, cold extremities, and defective sensibilities. Trophic disturbances are easily set up; their secretions are defective and abnormal, with unpleasant odor; the heart is weak with defective valves, and often an open foramen ovale. They have the vaulted palate, the jaw protrudes, and the teeth project. They are dwarfish, and retain an infantile appearance; they are liable to deformities of the fingers and toes, coloboma and hernia, and the testicles are occasionally wanting.

Cretinoid idiots are not common; they are short, with broad features, wide distance between the eyes, mouth large, thick, lips kept open, hands and feet thick and broad.

Microcephalic idiots, in which there is lack of development of all the cerebrum or only portions of it, or parts may be entirely absent; the deficiency is generally in a diminution in the size of the hemispheres. The head is narrow and tapering toward the top, the nerves, basal ganglia, and spinal cord are usually better developed than the hemispheres. The cerebellum relatively larger than in normal brains.

The further divisions are eclampsic, epileptic, hydrocephalic, paralytic, traumatic, inflammatory, etc. It will be unnecessary to go into a detailed explanation of these varieties. In idiots there is scarcely any mental life; they eat and drink when it is given them regardless of what it is; they neither speak nor have consciousness; they manifest such pleasure and pain as they are capable of by inarticulate sounds or screams with disorderly movements; they are incapable of education. Some idiots may recognize persons they frequently see; they have no memory or idea of time. Their appearance is usually hideous; they eat ravenously what is set before them; they often drink the most

disgusting and disagreeably tasting fluids; they do not appear to suffer pain as normal individuals; they do not notice bruises and cuts, and often show no evidence of extreme changes of temperature.

Imbecility is a less profound arrest of the mental processes; it usually occurs as the result of some disease process, if not at birth in the first three (3) or four (4) years of life, but it may also occur before birth as some defect in development. Imbeciles vary very much as to their behavior, facial expression, movements, etc., and their ability to learn. They are susceptible of more or less education. Those who suffer epilepsy as a complication are less favorable in this respect. The degree of mental activity varies; many make great efforts to learn to walk and what is taught them. They often have great difficulty in learning numbers. If they are slow in learning to walk, they will be slow in learning to speak and in the acquiring of other knowledge. The ability to speak depends upon the range of ideas which the child is capable of. Some idiots never speak; they appear to be aphasic; they often show an aptitude for music.

These imbeciles and idiots may have, besides the epilepsy alluded to, paralysis, hemiplegic, or paraplegic in type (see Spastic Hemiplegia in Children), as the result of atrophies of the brain. Sclerosis disseminated may be found, and various abnormalities of the cerebral conformation.

For further information on this subject consult Ireland, Idiocy and Imbecility; E. Seguin, Idiocy; the reports of Dr. Kerlin, Dr. Wilbur, etc.

Bibliography.—Sankey, Lectures on Mental Diseases.—Clouston, Mental Diseases.—Hammond, Treatise on Insanity.—Greisinger, Mental Disease, Translation.—Spitzka, Insanity, 2d edition.—Bevan Lewis, Text-Book of Mental Disease.—Mickel, General Paralysis of the Insane.—Krafft Ebing, Lehrbuch der Psychiatrie.—Mendal, Die progressive Paralyse der Irren.—Voisin, Paralysie Générale des Aliénés.—The Journal of Mental Science.—The American Journal of Insanity.

INDEX.

ABSCESS of brain, 106
Acromegaly, 89
Acute ascending paralysis, 56
Acute infectious multiple neuritis, 26
Acute meningitis cerebral, 96
Acute myelitis of the anterior horns, 58, 60
Acute poliomyelitis anterior, 58, 60
Acute spinal meningitis, 51
Acute spinal paralysis of the adult, 60
Agraphia, 119
Alcoholic insanity, 174
Alcoholic paralysis, 22
Amyotrophic lateral sclerosis, 65
Anæsthesia is in the distribution of injured nerves, 18
Angina pectoris, 141
Aphasia, 119
Apoplectiform seizures in locomotor ataxia, 74
Apraxia, 119
Argylle Robertson pupil, 72
Arthropathies in locomotor ataxia, 74
Ataxic paraplegia, 84

BASE of brain, lesions of, 132
Bell's palsy, 30
Brachial plexus, paralysis of, 37
Brain, abscess of, 106

CAUSALGIA, 17
Cephalalgia, 138
Cerebellum, lesions of, 130
Cerebral glosso-labio laryngeal paralysis, 123
Cerebral hemorrhage, 99
Cerebral localization, 117
Cerebral meningitis, acute, 96
Cerebro-spinal sclerosis, 107
Cervico-brachial neuralgia, 48
Cervico-occipital neuralgia, 47
Choked disc, 104
Chorea, 134
hereditary, 135
Chronic hydrocephalus, 98
Chronic myelitis of the anterior horns, 62
Circular insanity, 170
Circumflex nerve, paralysis of, 36
Combined sclerosis, 84
Compression myelitis, 54
Conceptions, imperative, 177
Contractures in locomotor ataxia, 74
"Crises" in locomotor ataxia, 74
Crus cerebri, lesions of, 139

DEGENERATIVE insanities, 164
Delusions, 154
Dementia, paralytica, 184
senile, 162
terminal, 163
Digiti mortui, 150
Disseminated cerebro-spinal sclerosis, 107
Dyschromatopsie, 125
Dystrophies, muscular, 85

EMBOLISM, 101
Endarteritis, 101
Epilepsy, 109
Epileptic insanity, 172
Erb's paralysis, 37
Erythemomegalalgia, 151
Exophthalmic goitre, 140

FACIAL atrophy, 142
Facial paralysis, peripheral, 30
Facial spasm, unilateral, 42

Fifth-nerve neuralgia, 45
Friedreich's disease, 80

GENERAL paralysis of the insane, 184
Glosso-labio laryngeal paralysis, 63, 65
cerebral, 123
Goitre, exophthalmic, 140
Graves's disease, 140

HALLUCINATIONS, 154
Headache, 138
Hemianæsthesia, 125
Hemianopsia, 120
Hemicrania, 46
Hemiparetic attacks in locomotor ataxia, 74
Hemiplegia, spastic, 114
Hemorrhage, cerebral, 99
Hereditary ataxia, 80
Hereditary chorea, 135
Herpes zoster, 49
Hydrocephalus, chronic, 98
Hypochondria, 182
Hysteria, 143
Hysterical insanity, 169

IDIOCY, 188
Illusions, 154
Imbecility, 188
Imperative conceptions, 177
Infantile spinal paralysis, 58
Infectious neuritis, 26
Injuries of nerves, 17
Insanity, alcoholic, 174
circular, 170
epileptic, 172
hysterical, 169
periodic, 169
Intracranial tumors, 103

LANDRY'S paralysis, 56
Laryngeal paralysis, 37
Lateral amyotrophic sclerosis, 65
Lateral columns, sclerosis of, 70
Lead paralysis, 25
Lepto-meningitis, spinal, 51
infantum, 96
with pus, 96
Lesions of base of brain, 132
Lesions—
of centrum ovale, 122
of cerebellum, 130
of corpora quadrigeminal region, 125
of corpus striatum and lenticular nucleus, 122
of crus cerebri, 129
of internal capsule, 125
of posterior part internal capsule, 125
of thalamus, 125
Localization, cerebral, 117
of functions in spinal segments, 94
of lesions in spinal cord, 91
Locomotor ataxia, 72
Lumbar plexus, paralysis of, 37

MANIA, 160
periodic, 169
Median nerve, paralysis of, 35
Melancholia, 155
periodic, 170
Meningitis, cerebral, acute, 96
purulent, 96
spinal, acute, 51
tubercular, 97
Mental disorders in locomotor ataxia, 76
Migraine, 46
Morvan's disease, 26
Muscular atrophy, in locomotor ataxia, 74
peroneal form, 64
progressive, 62
Muscular dystrophies, 85
Muscular pseudo-hypertrophy, 85
Musculo-spiral nerve, paralysis of, 36
Myelitis, 52
compression, 54
of anterior horns, acute, 58
of anterior horns, chronic, 62
Mysophobia, 179

NAILS, trophic disorders of, 18
Nerve, abducens, paralysis of, 30
Nerve, circumflex, paralysis of, 36
median, paralysis of, 35
musculo-spiral, paralysis of, 36
ocular-motor, paralysis of, 29

Nerves—
ulnar, 35
Nerves, injuries of, 17
trophic disorders in, 18
Neuralgia of cervico-brachial nerve, 48
of cervico-occipital nerve, 47
of fifth nerve, 45
sciatic, 48
Neurasthenia, 136
Neuritis, acute infectious multiple, 26
alcoholic, 22
diphtheritic, 24
from lead poisoning, 25
multiple, 21
peripheral, 20

OBSTETRICAL paralysis, 37
Occlusion of vessels, 101
Ophthalmoplegia, 104, 126
Optic neuritis, 104
Optic radiations of Gratiolet, lesions of, 125

PARALYSIS, acute ascending, 56
Paralysis agitans, 111
Paralysis, alcoholic, 22
diphtheritic, 24
Erb's, 37
in caries of spine, 55
in fracture of spine, 55
in locomotor ataxia, 74
laryngeal branches of vagus, 37
lead, 25
lumbar plexus, 37
obstetrical, 37
of brachial plexus, 37
of circumflex nerve, 36
of facial nerve, peripheral, 30
of median nerve, 35
of musculo-spiral nerve, 36
of peripheral nerves, 29
of third and sixth nerves, 29
of ulnar, 35
pseudo-hypertrophic, 85
sacral plexus, 37
Paranoia, 165
Paraplegia, ataxic, 84
spastic, 70
Periarteritis, 100
Periodic mania, 169
Periodic melancholia, 170
Peroneal form of progressive muscular atrophy, 64
Perverted sexual instincts, 180
Pituitary body, tumors in neighborhood of, 133
Poliomyelitis anterior, acute, 58, 60
Postero-lateral spinal sclerosis, 80
Pott's disease, 55
Primary lateral sclerosis, 70
Progressive paresis, 184
Progressive muscular atrophy, 62, 64
Pupil, in locomotor ataxia, 72
Purulent meningitis, 96

QUADRIGEMINAL region, lesions of, 125

RAYNAUD'S disease, 152

SACRAL plexus, paralysis of, 37
Sciatica, 48
Sclerosis, cerebro-spinal, 107
combined, 84
lateral amyotrophic, 65
columns, 70
Senile dementia, 162
Sensory aphasia, 119
Seventh nerve, paralysis of, 30
Sexual instincts, perverted, 180
Sick headache, 46
Sixth nerve, paralysis of, 30
Spasm, 40
in muscles supplied by spinal accessory, 41
splenius capitis, 43
unilateral facial, 42
Spastic hemiplegia in children, 114
Spastic paraplegia, 70
Spastic spinal paralysis, 70
Spinal cord, localization of lesions in, 91
Spinal meningitis, acute, 51
paralysis, infantile, 58
paralysis of the adult, 60
Spinal segments, localization of functions in, 94
Spine, caries of, 55
fracture of, 55
Subcortical lesions, 122
Syringo myelia, 67

TABES dorsalis, 70
Terminal dementia, 163
Tetanoid paraplegia, 70
Thalamus, lesions of, 125
Third nerve, paralysis of, 29
Thomsen's disease, 44
Thrombosis, 101
Trifacial neuralgia, 45
Trophic disorders, in locomotor ataxia, 75
Tubercular meningitis, 97
Tumors, in neighborhood of pituitary body, 133
intracranial, 103
intraspinal, 55

ULNAR nerve, paralysis of, 35
Unilateral facial atrophy, 142
Unilateral facial spasm, 42

VAGUS, paralysis of laryngeal branches, 37
Vaso-motor neurosis, 149

WORD blindness, 119
Word deafness, 119
Writer's cramp, 43

ZOSTER, herpes, 49

MEDICAL AND SURGICAL WORKS

PUBLISHED BY

W. B. SAUNDERS,

No. 925 Walnut Street, - - Philadelphia.

AMERICAN TEXT-BOOK OF DISEASES OF CHILDREN 6, 7
AMERICAN TEXT-BOOK OF GYNECOLOGY 8
AMERICAN TEXT-BOOK OF PRACTICE 4, 5
AMERICAN TEXT-BOOK OF SURGERY 2, 3
ASHTON'S OBSTETRICS 24
BALL'S BACTERIOLOGY 30
BROCKWAY'S PHYSICS 31
CERNA'S NOTES ON THE NEWER REMEDIES 18
CHAPMAN'S MEDICAL JURISPRUDENCE AND TOXICOLOGY . . . 16
COHEN & ESHNER'S DIAGNOSIS 29
CRAGIN'S GYNÆCOLOGY 26
DA COSTA'S MANUAL OF SURGERY 14
DE SCHWEINITZ'S DISEASES OF THE EYE 10
GARRIGUES' DISEASES OF WOMEN 20
GROSS'S AUTOBIOGRAPHY 12
HARE'S PHYSIOLOGY 22
HAMPTON'S NURSING: ITS PRINCIPLES AND PRACTICE 17
JACKSON AND GLEASON'S DISEASES OF EYE, NOSE, AND THROAT . . 28
KEATING'S PRONOUNCING DICTIONARY OF MEDICINE 11
KEATING'S HOW TO EXAMINE FOR LIFE INSURANCE 14
KEEN'S OPERATION BLANKS 21
MARTIN'S SURGERY 22
MARTIN'S MINOR SURGERY, BANDAGING, AND VENEREAL DISEASES . 27
MORRIS' MATERIA MEDICA AND THERAPEUTICS 25
MORRIS' PRACTICE OF MEDICINE 25
NANCREDE'S ANATOMY AND MANUAL OF DISSECTION 15
NANCREDE'S ANATOMY 23
NORRIS' SYLLABUS OF OBSTETRICAL LECTURES 20
POWELL'S DISEASES OF CHILDREN 28
SAUNDERS' POCKET MEDICAL FORMULARY 13
SAUNDERS' POCKET MEDICAL LEXICON 19
SAYRE'S PRACTICE OF PHARMACY 30
SEMPLE'S PATHOLOGY AND MORBID ANATOMY 24
SEMPLE'S LEGAL MEDICINE, TOXICOLOGY, AND HYGIENE . . . 27
SENN'S SYLLABUS OF LECTURES ON SURGERY 18
SHAW'S NERVOUS DISEASES AND INSANITY 31
STELWAGON'S DISEASES OF THE SKIN 26
STEVENS' PRACTICE OF MEDICINE 16
STEVENS' MATERIA MEDICA AND THERAPEUTICS 17
STEWART AND LAWRANCE'S MEDICAL ELECTRICITY 32
THORNTON'S MANUAL OF PRESCRIPTION WRITING 32
VIERORDT AND STUART'S MEDICAL DIAGNOSIS 9
WILSON'S DEFORMITIES OF THE BONES AND JOINTS 19
WOLFF'S CHEMISTRY 23
WOLFF'S EXAMINATION OF URINE 29

For Sale by Subscription only.

An American Text-Book of Surgery.

Forming One Handsome Royal Octavo Volume of over 1200 pages (10 x 7 inches), with nearly 500 Wood-cuts in Text, and 37 Colored and Half-tone Plates, many of them Engraved from Original Photographs and Drawings furnished by the Authors.

Price, Cloth, $7 net; Sheep, $8 net; Half Russia, $9 net.

BY

CHARLES H. BURNETT, M.D., Emeritus Professor of Otology, Philadelphia Polyclinic.

PHINEAS S. CONNER, M.D., LL.D., Professor of Surgery, Medical College of Ohio and Dartmouth Medical College.

FREDERIC S. DENNIS, M.D., Professor of Principles and Practice of Surgery, Bellevue Hospital Medical College.

WILLIAM W. KEEN, M.D., LL.D., Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College.

CHARLES B. NANCREDE, M.D., Professor of Surgery and of Clinical Surgery, University of Michigan.

ROSWELL PARK, M.D., Professor of Surgery, Medical Department of the University of Buffalo.

LEWIS S. PILCHER, M.D., Professor of Clinical Surgery in the New York Post-Graduate School and Hospital.

NICHOLAS SENN, M.D., PH.D., Professor of Practice of Surgery and of Clinical Surgery, Rush Medical College.

FRANCIS J. SHEPHERD, M.D., C.M., Professor of Anatomy and Lecturer on Operative Surgery, McGill University, Montreal, Canada.

LEWIS A. STIMSON, B.A., M.D., Professor of Surgery in the University of the City of New York.

WILLIAM THOMSON, M.D., Professor of Ophthalmology, Jefferson Medical College.

J. COLLINS WARREN, M.D., Associate Professor of Surgery, Harvard University.

J. WILLIAM WHITE, M.D., PH.D., Professor of Clinical Surgery, University of Pennsylvania.

EDITED BY

WILLIAM W. KEEN, M.D., LL.D., AND
J. WILLIAM WHITE, M.D., PH.D.

2

The want of a text-book which could be used by the practitioner and at the same time be recommended to the medical student has been deeply felt, especially by teachers of surgery. Hence, when it was suggested to a number of them that it would be well to unite in preparing a book of this description, great unanimity of opinion was found to exist, and the gentlemen before named gladly consented to join in its production. While there is no distinctive American Surgery, yet America has contributed very largely to the progress of modern surgery, and among the foremost of those who have aided in developing this art and science will be found the authors of the present volume. All of them are teachers of surgery in leading medical schools and hospitals in the United States and Canada.

Especial prominence has been given to Surgical Bacteriology; a feature which is believed to be unique in a surgical text-book in the English language. Asepsis and Antisepsis have received particular attention, and full details of the various methods of disinfecting instruments, hands, and the field of operations, sutures, etc., will be found. The text is brought well up to date in such important branches as cerebral, spinal, intestinal, and pelvic surgery, and the most important and newest operations in these departments are described and illustrated.

The text of the entire book has been submitted to all the authors for their mutual criticism and revision, also an entirely new and original feature in book-making. The book, as a whole, therefore, expresses on all the important surgical topics of the day the consensus of opinion of the eminent surgeons who have joined in its preparation.

One of the most attractive features of the book is its illustrations. Very many of them are original and faithful reproductions of photographs taken directly from patients or from specimens, and the modern improvements in the art of engraving have enabled the publishers to produce illustrations which it is believed are superior to those in any similar work.

For Sale by Subscription only.

A TREATISE

ON THE

Theory and Practice of Medicine.

BY

AMERICAN TEACHERS.

EDITED BY WILLIAM PEPPER, M.D., LL.D.,
Provost and Professor of the Theory and Practice of Medicine and of Clinical Medicine in the University of Pennsylvania.

To be Completed in Two Handsome Royal Octavo Volumes of about 1000 pages each, with Illustrations to Elucidate the Text wherever Necessary.

Price per vol., Cloth, $5 net; Sheep, $6 net; Half Russia, $7 net.

VOLUME I. contains:

Hygiene.

J. S. BILLINGS, Professor of Hygiene, University of Pennsylvania.

Fevers (Ephemeral, Simple Continued, Typhus, Typhoid, Epidemic Cerebro-spinal Meningitis, and Relapsing).

WM. PEPPER, M.D., Provost and Professor of the Theory and Practice of Medicine and of Clinical Medicine, University of Pennsylvania.

Scarlatina, Measles, Rotheln, Variola, Varioloid, Vaccinia, Varicella, Mumps, Whooping-cough, Anthrax, Hydrophobia, Trichinosis, Actinomycosis, Glanders, and Tetanus.

JAMES T. WHITTAKER, M.D., Professor of the Theory and Practice of Medicine and of Clinical Medicine, Medical College of Cincinnati, O.

Tuberculosis, Scrofula, Syphilis, Diphtheria, Erysipelas, Malaria, Cholera, and Yellow Fever.

W. GILMAN THOMPSON, M.D., Professor of Physiology, New York University Medical College.

Nervous, Muscular, and Mental Diseases (Including Opium Habit, etc.).

HORATIO C. WOOD, M.D., Professor of Materia Medica, Pharmacy, and General Therapeutics, and Clinical Professor of Nervous Diseases, University of Pennsylvania. And

WILLIAM OSLER, M.D., Professor of Practice of Medicine, Johns Hopkins University, Baltimore, Md.

4

VOLUME II. contains:

Urine (Chemistry and Microscopy).

JAMES W. HOLLAND, M.D., Professor of Medical Chemistry and Toxicology, Jefferson Medical College, Philadelphia.

Kidneys and Lungs.

FRANCIS DELAFIELD, M.D., Professor of Pathology and Practice of Medicine, College of Physicians and Surgeons, New York City.

Air-passages (Larynx and Bronchi) and Pleura.

JAMES C. WILSON, M.D., Professor of Practice of Medicine and of Clinical Medicine, Jefferson Medical College, Philadelphia.

Pharynx, Œsophagus, Stomach, and Intestines (Including Intestinal Parasites).

WILLIAM PEPPER, M.D., Provost and Professor of the Theory and Practice of Medicine and of Clinical Medicine, University of Pennsylvania.

Peritoneum, Liver, and Pancreas.

REGINALD H. FITZ, M.D., Hersey Professor of Physics, Harvard Medical School.

Diathetic Diseases (Rheumatism, Rheumatoid Arthritis, Gout, Lithæmia, and Diabetes).

HENRY M. LYMAN, M.D., Professor of Principles and Practice of Medicine, Rush Medical College, Chicago, Ill.

Heart, Aorta, Arteries, and Veins.

E. G. JANEWAY, M.D., Professor of Principles and Practice of Medicine, Bellevue Hospital Medical College, New York City.

Blood and Spleen.

WILLIAM OSLER, M.D., Professor of Practice of Medicine, Johns Hopkins University, Baltimore, Md.

Inflammation, Embolism, Thrombosis, Fever, and Bacteriology.

W. H. WELCH, M.D., Professor of Pathology, Johns Hopkins University, Baltimore, Md.

The articles are not written as though addressed to students in lectures, but are exhaustive descriptions of diseases with the newest facts as regards Causation, Symptomatology, Diagnosis, Prognosis, and Treatment, and will include a large number of approved Formulæ. The recent advances made in the study of the bacterial origin of various diseases are fully described, as well as the bearing of the knowledge so gained upon prevention and cure. The subjects of Bacteriology as a whole and of immunity are fully considered in a separate section.

Methods of diagnosis are given the most minute and careful attention, thus enabling the reader to learn the very latest methods of investigation without consulting works specially devoted to the subject.

For Sale by Subscription only.

AN AMERICAN TEXT-BOOK

OF THE

DISEASES OF CHILDREN.

INCLUDING

Special Chapters on Essential Surgical Subjects; Diseases of the Eye, Ear, Nose, and Throat; Diseases of the Skin; and on the Diet, Hygiene, and General Management of Children.

BY

AMERICAN TEACHERS.

EDITED BY

LOUIS STARR, M.D.,

Physician to the Children's Hospital and Consulting Pediatrist to the Maternity Hospital, Philadelphia; late Clinical Professor of Diseases of Children in the Hospital of the University of Pennsylvania, etc., etc.,

ASSISTED BY

THOMPSON S. WESTCOTT, M.D.,

Attending Physician to the Dispensary for Diseases of Children, Hospital of the University of Pennsylvania, etc.

Forming a handsome imperial 8vo vol. of more than 1200 pages, profusely illustrated with wood-cuts, half-tone and colored plates.

ANNOUNCEMENT.

An American Text-book of the Diseases of Children will be issued as a handsome imperial octavo volume of about 1200 pages, uniform with an American Text-book of Surgery, containing numerous wood-cuts, half-tone plates, and colored illustrations. The plan contemplates a series of original articles written by some sixty well-known pædiatrists, representing collectively the present teachings of the most prominent medical schools and colleges of America. The work is not intended to be encyclopædic in character, but to be a practical book suitable for constant and handy reference by the practitioner and advanced student.

One decided innovation for a book of its size is the large number of authors, nearly every article being contributed by a specialist in the line on which he writes. This, while entailing considerable labor upon the editors, has resulted in the publication of a work thoroughly new and abreast of the times. The entire work has been practically written in a few months, thus removing the usual objection to treatises of this class, that they are out of date before they are published.

Especial attention is given to the consideration of the latest accepted teaching upon the Etiology, Symptoms, Pathology, Diagnosis, and Treatment of the disorders of children, with the introduction of many special formulæ and therapeutic procedures.

Special chapters embrace at unusual length the diseases of the Eye, Ear, Nose and Throat, and the Skin; while the introductory chapters cover fully the important subjects of Diet, Hygiene, Exercise, Bathing, and the Chemistry of Food. Tracheotomy, Intubation, Circumcision, and such minor surgical procedures coming within the province of the medical practitioner are carefully considered.

NOW READY.

For Sale by Subscription only.

An American Text-Book of Gynecology

MEDICAL AND SURGICAL.

FOR THE USE OF

STUDENTS AND PRACTITIONERS.

BY

JOHN M. BALDY, M.D., HENRY T. BYFORD, M.D.,
EDWIN CRAGIN, M.D., J. H. ETHERIDGE, M.D.,
WILLIAM GOODELL, M.D., HOWARD A. KELLY, M.D.,
FLORIAN KRUG, M.D., E. E. MONTGOMERY, M.D.,
WILLIAM R. PRYOR, M.D., GEORGE M. TUTTLE, M.D.

Forming one handsome royal 8vo. volume, profusely illustrated.

Price, Cloth, $6; Sheep, $7; Half Russia, $8.

In this volume all anatomical descriptions, excepting those essential to a clear understanding of the text, have been omitted, the illustrations being largely depended upon to elucidate the anatomy of the parts. The work will be found thoroughly practical in its teachings, and is intended, as its title implies, to be a working text-book for physicians and students. A clear line of treatment has been laid down in every case, and although no attempt has been made to discuss mooted points, still the most important of these have been noted and explained. The operations recommended are fully illustrated, so that the reader may have under his eye a picture of the procedure described in the text, and cannot fail to grasp the idea.

All extraneous matter and discussions have been carefully excluded, the attempt being made to allow nothing to cumber the text.

The subject-matter has been brought fully up to date at every point, and the work is as nearly as possible the combined opinions of the ten specialists who figure as the authors.

The work is well illustrated throughout with wood-cuts, half-tone and colored plates, mostly selected from the authors' private collections.

Now Ready—Third and Revised Edition.

For Sale by Subscription only

MEDICAL DIAGNOSIS.

BY DR. OSWALD VIERORDT,

Professor of Medicine at the University of Heidelberg; formerly Privat Docent at University of Leipzig; Professor of Medicine and Director of the Medical Polyclinic at the Univ. of Jena.

Translated with additions, from the Second Enlarged German Edition, with the Author's Permission.

BY FRANCIS H. STUART, A.M., M.D.,

Member of the Medical Society of the County of Kings, N. Y.; Fellow of the New York Academy of Medicine; Member of the British Medical Association, etc.

In One Handsome Royal Octavo Volume of 700 Pages.

178 Fine Wood-cuts in Text, Many of Which are in Colors.

Price, Cloth, $4 net; Sheep, $5 net; Half Russia, $5.50 net.

This Valuable Work is now Published in German, English, Russian, and Italian.

In this work, as in no other hitherto published, are given full and accurate explanations of the phenomena observed at the bedside. IT IS DISTINCTLY A CLINICAL WORK, by a master teacher, characterized by thoroughness, fulness, and accuracy. IT IS A MINE OF INFORMATION UPON THE POINTS THAT ARE SO OFTEN PASSED OVER WITHOUT EXPLANATIONS. Especial attention has been given to the germ theory as a factor in the origin of disease.

The issue of a third edition within two years indicates the favor with which it has been received by the profession.

PROFESSIONAL OPINIONS.

"One of the most valuable and useful works in medical literature."

(Signed) ALEXANDER J. C. SKENE, M.D.,
Dean of the Long Island College Hospital, and Professor of the Medical and Surgical Diseases of Women.

"Indispensable to both 'students and practitioners.'"

(Signed) F. MINOT, M.D.,
Hersey Professor of Theory and Practice of Medicine, Harvard University.

"It is very well arranged and very complete, and contains valuable features not usually found in the ordinary books."

(Signed) J. H. MUSSER, M.D.,
Assistant Professor Clinical Medicine, University of Pennsylvania.

"A treasury of practical information which will be found of daily use to every busy practitioner who will consult it."

(Signed) C. A. LINDSLEY, M.D.,
Professor of Theory and Practice of Medicine, Yale University, New Haven, Conn.

For Sale by Subscription only.

NOW READY.

DISEASES OF THE EYE.

A Hand-Book of Ophthalmic Practice.

By G. E. de SCHWEINITZ, MD.,

Professor of Diseases of the Eye, Philadelphia Polyclinic; Professor of Clinical Ophthalmology, Jefferson Medical College, Philadelphia; Ophthalmic Surgeon to Children's Hospital and to the Philadelphia Hospital; Ophthalmologist to the Orthopædic Hospital and Infirmary for Nervous Diseases; late Lecturer on Medical Ophthalmoscopy, University of Pa., etc.

Forming a handsome royal 8vo. vol. of more than 660 pages.

Over 200 fine wood-cuts, many of which are original, and two chromo-lithographic plates.

Price, Cloth, $4 net; Sheep, $5 net; Half Russia, $5.50 net.

PROFESSIONAL OPINIONS.

"A work that will meet with the requirements not only of the specialist, but of the general practitioner in a rare degree. I am satisfied that unusual success awaits it." (Signed) WILLIAM PEPPER, M.D.,

Provost and Professor of Theory and Practice of Medicine and Clinical Medicine in the University of Pennsylvania.

"Contains in concise and reliable form the accepted views of Ophthalmic Science." (Signed) WILLIAM THOMSON, M.D.,

Professor of Ophthalmology, Jefferson Medical College, Philadelphia, Pa.

"One of the best hand-books now extant on the subject."

(Signed) J. O. STILLSON, M.D.,

Professor of Eye and Ear, Central College of Physicians and Surgeons, Indianapolis, Ind.

"Vastly superior to any book on the subject with which I am familiar."

(Signed) FRANCIS HART STUART, M.D.,

Brooklyn, N. Y.

"Contains in the most attractive and easily understood form just the sort of knowledge which is necessary to the intelligent practice of general medicine and surgery." (Signed) J. WILLIAM WHITE, M.D.,

Professor of Clinical Surgery in the University of Pennsylvania.

"A very reliable guide to the study of eye diseases, presenting the latest facts and newest ideas." (Signed) SWAN M. BURNETT, M.D.,

Prof. of Ophthalmology and Otology, Med. Department Univ. Georgetown, Washington, D. C.

Second Revised Edition. For Sale by Subscription only.

A NEW PRONOUNCING DICTIONARY OF MEDICINE.

WITH

Phonetic Pronunciation, Accentuation, Etymology, etc.

BY JOHN M. KEATING, M.D., LL.D.,

Fellow of the College of Physicians of Philadelphia; Vice-President of the American Pædiatric Society; Ex-President of the Association of Life Insurance Medical Directors; Editor "Cyclopædia of the Diseases of Children," etc.;

AND

HENRY HAMILTON,

Author of "A new Translation of Virgil's Æneid into English Rhyme;" Co-Author of "Saunders' Medical Lexicon," etc.

WITH AN APPENDIX

CONTAINING IMPORTANT TABLES OF BACILLI, MICROCOCCI, LEUCOMAÏNES, PTOMAÏNES; DRUGS AND MATERIALS USED IN ANTISEPTIC SURGERY; POISONS AND THEIR ANTIDOTES; WEIGHTS AND MEASURES; THERMOMETRIC SCALES; NEW OFFICINAL AND UNOFFICINAL DRUGS, ETC. ETC.

Forming One very Attractive Volume of over 800 pages.

Price, Cloth, $5 net; Sheep, $6 net; Half Russia, $6.50 net.

With Denison's Patent Index for Ready Reference.

"I am much pleased with Keating's Dictionary, and shall take pleasure in recommending it to my classes." (Signed) HENRY M. LYMAN, M.D.,
Professor of Principles and Practice of Medicine, Rush Medical College, Chicago, Ill.

"I am convinced that it will be a very valuable adjunct to my study table, convenient in size and sufficiently full for ordinary use."
(Signed) C. A. LINDSLEY, M.D.,
Professor of Theory and Practice of Medicine, Medical Dept. Yale University, Secretary Connecticut State Board of Health, New Haven, Connecticut.

"I will point out to my classes the many good features of this book as compared with others, which will, I am sure, make it very popular with students."
(Signed) JOHN CRONYN, M.D., LL.D.,
Professor of Principles and Practice of Medicine and Clinical Medicine; President of the Faculty, Medical Dept. Niagara University, Buffalo, N. Y.

"My examination and use of it have given me a very favorable opinion of its merit, and it will give me pleasure to recommend its use to my class."
(Signed) J. W. H. LOVEJOY, M.D.,
Professor of Theory and Practice of Medicine, and President of the Faculty, Medical Dept. Georgetown University, Washington, D. C.

Second Edition, for Sale by Subscription.

AUTOBIOGRAPHY

OF

SAMUEL D. GROSS, M.D.,

D. C. L. OXON., LL.D. CANTAB., EDIN., JEFFERSON COLLEGE, UNIV. PA., EMERITUS PROFESSOR OF SURGERY IN THE JEFFERSON MEDICAL COLLEGE OF PHILADELPHIA.

WITH REMINISCENCES OF

HIS TIMES AND CONTEMPORARIES.

Edited by his Sons, SAMUEL W. GROSS, M.D., LL.D., late Professor of Principles of Surgery and of Clinical Surgery in the Jefferson Medical College, and A. HALLER GROSS, A.M., of the Philadelphia Bar.

Preceded by a Memoir of Dr. Gross by the late Austin Flint, M.D., LL.D.

In two handsome vols., each containing over 400 pages, demy 8vo., ex. cloth, gt. tops, with fine Frontispiece engraved on steel.

Price . . . $5.00 net.

This AUTOBIOGRAPHY, which was continued by the late eminent Surgeon until within three months before his death, contains a full and accurate history of his early struggles, trials, and subsequent successes, told in a singularly interesting and charming manner, and embraces short and graphic pen portraits of many of the most distinguished men—surgeons, physicians, divines, lawyers, statesmen, scientists, etc. etc.—with whom he was brought in contact in this country and in Europe; the whole forming a retrospect of more than three-quarters of a century.

SAUNDERS'

Pocket Medical Formulary

BY

WILLIAM M. POWELL, M.D.,

Attending Physician to the Mercer House for Invalid Women, at Atlantic City.

CONTAINING

1750 Formulæ, selected from several hundreds of the best known authorities.

Forming a handsome and convenient Pocket Companion of nearly 300 printed pages, and blank leaves for additions.

WITH AN APPENDIX

Containing Posological Table; Formulæ and Doses for Hypodermic Medication: Poisons and their Antidotes; Diameters of the Female Pelvis and Fœtal Head; Obstetrical Table; Diet List for various diseases; Materials and Drugs used in Antiseptic Surgery: Treatment of Asphyxia from Drowning; Surgical Remembrancer; Tables of Incompatibles; Eruptive Fevers; Weights and Measures, etc.

Third Edition, Revised and greatly Enlarged.

Handsomely bound in Morocco, with Patent Index, Wallet, and Flap.

Price, $1.75 net.

THERAPEUTIC GAZETTE, January, 1892.—"The prescriptions have been taken from the writings or practice of Physicians whose experience qualifies them to be worthy of trial. We heartily recommend this volume to all who desire to purchase such a work."

NEW YORK MEDICAL RECORD, February 27, 1892.—"This little book, that can be conveniently carried in the pocket, contains an immense amount of material. It is very useful, and, as the name of the author of each prescription is given, is unusually reliable."

THIRD EDITION.

How to Examine for Life Insurance.

By JOHN M. KEATING, M.D.,

Medical Director Penn Mutual Life Insurance Co.; Ex-President of the Association of Life Insurance Medical Directors; Consulting Physician for Diseases of Women at St. Agnes' Hospital, Phila.; Gynæcologist to St. Joseph's Hospital, etc.

With two large Phototype Illustrations, and a Plate prepared by Dr. McClellan from special Dissections; also, numerous cuts to elucidate the text,

Price, in Cloth, $2.00.

PART I. has been carefully prepared from the best works on physical diagnosis, and is a short and succinct account of the methods used to make examinations; a description of the normal condition, and of the earliest evidences of disease.

PART II. contains the instructions of twenty-four Life Insurance Companies to their medical examiners.

PRESS NOTICES.

"The most practical manual on this subject that has yet been offered as a guide to the medical examiner for life insurance. It contains much that is needful in the way of reference that cannot be found grouped elsewhere."—*Buffalo Medical and Surgical Journal.*

"Just such a book as the young and inexperienced medical examiner needs."—*The American Journal of the Medical Sciences.*

"By far the most useful book which has yet appeared on insurance examination. The book should be at the right hand of every physician interested in this special branch of medical science."—*The Medical News.*

"The volume is replete with information and suggestions, and is a valuable contribution to the literature of the medical department of life underwriters' work."—*The United States Review* (Insurance Journal).

In Active Preparation. Ready Shortly.

A

MANUAL OF SURGERY,

GENERAL AND OPERATIVE.

BY

JOHN CHALMERS DA COSTA, M. D.,

Instructor in Surgery, Jefferson Medical College.

A new manual of the Principles and Practice of Surgery, intended to meet the growing demand for students and others for a medium-sized work which will embody all the newer methods of procedure detailed in the *larger text-books.*

SAUNDERS'
SERIES OF MANUALS

FOR

STUDENTS AND PRACTITIONERS.

The aim of the Publisher is to furnish, in this Series of Manuals, a number of high-class works by prominent teachers who are connected with the principal Colleges and Universities of this country; the position and experience of each being a guarantee of the soundness and standard of text of the subject on which he writes.

Especial care has been exercised in the choice of large, clear, readable type; a high grade of slightly toned paper, of a shade particularly adapted for reading by artificial light; high class illustrations, printed in colors when necessary to a clear elucidation of the text; and strong, attractive, and uniform bindings.

The prices vary greatly ($1.00 to $2.50), it not being desirable to fix an arbitrary standard and pad the volumes accordingly.

Now Ready—Fourth Edition.

CONTAINING

"HINTS ON DISSECTION."

Essentials of Anatomy and Manual of Practical Dissection.

BY CHARLES B. NANCREDE, M.D.,

Professor of Surgery and Clinical Surgery in the University of Michigan, Ann Arbor; Corresponding Member of the Royal Academy of Medicine, Rome, Italy; late Surgeon Jefferson Medical College, etc. etc.

With Handsome Full-page Lithographic Plates in Colors. Over 200 Illustrations.

No pains or expense has been spared to make this work the most exhaustive yet concise Student's Manual of Anatomy and Dissection ever published, either in this country or Europe.

The colored plates are designed to aid the student in dissecting the muscles, arteries, veins, and nerves. For this edition the woodcuts have all been specially drawn and engraved, and an Appendix added containing 60 illustrations representing the structure of the entire human skeleton, the whole based on the eleventh edition of Gray's Anatomy, and forming a handsome post 8vo. volume of over 400 pages.

Price, Extra Cloth or Oilcloth for the Dissection-Room, $2.00 net.

JUST PUBLISHED—SECOND EDITION.

A Manual of the Practice of Medicine.

By A. A. STEVENS, A.M., M.D.,

Instructor of Physical Diagnosis in the University of Pennsylvania, and Demonstrator of Pathology in the Woman's Medical College of Philadelphia.

Post 8vo., 502 pages, Illustrated. Price, Cloth, $2.50.

Contributions to the science of medicine have poured in so rapidly during the last quarter of a century, that it is well nigh impossible for the student, with the limited time at his disposal, to master elaborate treatises, or to cull from them that knowledge which is absolutely essential. From an extended experience in teaching, the author has been enabled by classification, the grouping of allied symptoms, and the judicious elimination of theories and redundant explanations, to bring within a comparatively small compass a complete outline of the Practice of Medicine.

NEW READY.

A Manual of Medical Jurisprudence AND TOXICOLOGY.

By HENRY CHAPMAN, M.D.,

Professor of Institutes of Medicine and Medical Jurisprudence in the Jefferson Medical College, Philadelphia; Member of the College of Physicians, Philadelphia, etc.

232 pp., post-octavo, with 36 Illustrations, some of which are in colors.

Price $1.25 Net.

For many years there has been a demand from members of the medical and legal professions for a medium-sized work on this most important branch of medicine. The necessarily prescribed limits of the work permit only the consideration of those parts of this extensive subject which the experience of the author as coroner's physician of the city of Philadelphia for a period of six years leads him to regard as the most material for practical purposes.

Particular attention is drawn to the illustrations, many being produced in colors, thus conveying to the layman a far clearer idea of the more intricate cases.

NURSING:

Its Principles and Practice,

FOR HOSPITAL AND PRIVATE USE.

By ISABELLA A. HAMPTON,

Graduate of the New York Training School for Nurses attached to Bellevue Hospital Superintendent of Nurses and Principal of the Training School for Nurses, Johns Hopkins Hospital, Baltimore, Md.; Late Superintendent of Nurses, Illinois Training School for Nurses, Chicago, Illinois.

Price, $2.00 net.

An entirely new work on the important subject of nursing, at once comprehensive and systematic. It is written in a clear, accurate, and readable style, suitable alike to the student and lay reader. It is of especial value to the graduated nurse who desires to acquire a practical working knowledge of the care of the sick and hygiene of the sick room. Thoroughly tested and approved processes in practical nursing only have been given, particularly in antiseptic surgery. Illustrations have been freely used wherever necessary to elucidate the text.

Maryland Medical Journal.—"The newest and most advanced methods, in a clear, concise manner."

Ontario Medical Journal.—"Will enable each of us to become a *training school* in himself."

Inter-Ocean (Chicago).—"No better guide."

The Churchman.—"Valuable for those contemplating nursing as a profession."

IN ACTIVE PREPARATION. READY SHORTLY.

A MANUAL OF

Materia Medica and Therapeutics.

BY

A. A. STEVENS, A.M., M.D.,

Instructor of Physical Diagnosis in the University of Pennsylvania and Demonstrator of Pathology in the Woman's Medical College of Philadelphia.

NOW READY.

A SYLLABUS

OF

Lectures on the Practice of Surgery.

ARRANGED IN CONFORMITY WITH

THE AMERICAN TEXT-BOOK OF SURGERY.

BY N. SENN, M.D., PH.D.,

Professor of Surgery in Rush Medical College, Chicago, and in the Chicago Polyclinic.

PRICE . . . $2.00.

This the latest work of its eminent author, himself one of the contributors to the "American Text-Book of Surgery," will prove of exceptional value to the advanced student who has adopted that work as his text-book. It is not only the syllabus of an unrivalled course of Surgical Practice, but an epitome or supplement to the larger work.

NOW READY.

Notes on the Newer Remedies,

THEIR

Therapeutic Applications and Modes of Application

BY DAVID CERNA, M.D., PH.D.

Demonstrator of and Lecturer on Experimental Therapeutics in the University of Pennsylvania.

Forming a small octavo volume of about 175 pages (7 x 5) inches.

PRICE - - - $1.25.

The work will take up in alphabetical order all the Newer Remedies, giving their physical properties, solubility, therapeutic applications, administration, and chemical formula. It will in this way, form a very valuable addition to the various works on Therapeutics now in existence.

Chemists are so multiplying compounds that if each compound is to be thoroughly studied, investigations must be carried far enough to determine the practical importance of the new agents.

Brevity and conciseness compel the omission of all bibliographical *references.*

SAUNDERS'

POCKET MEDICAL LEXICON;

OR,

Dictionary of Terms and Words used in Medicine and Surgery.

BY JOHN M. KEATING, M.D.,

Editor of "Cyclopædia of Diseases of Children," etc.; Author of the "New Pronouncing Dictionary of Medicine,"

AND

HENRY HAMILTON,

Author of "A New Translation of Virgil's Æneid into English Verse;" Co-author of a "New Pronouncing Dictionary of Medicine."

Price, 75 Cents, Cloth. $1.00, Leather Tucks.

"Saunders' Pocket Medical Lexicon—a very complete little work, invaluable to every student of medicine. It not only contains a very large number of words, but also tables of etymological factors common in medical terminology; abbreviations used in medicine, poisons and antidotes, etc."—*Annals of Gynæcology*, Philadelphia.

IN ACTIVE PREPARATION.

METHODS OF

PREVENTING AND CORRECTING

Deformities of the Bones and Joints.

A Handbook of Practical Orthopædic Surgery.

BY H. AUGUSTUS WILSON, M.D.,

Professor of General and Orthopædic Surgery, Philadelphia Polyclinic; Clinical Professor of Orthopædic Surgery, Jefferson Medical College, Philadelphia, etc., etc.

The aim of the author will be to provide a book of moderate size, containing comprehensive details that will enable general practitioners to thoroughly understand the mechanical features of the many forms of congenital and acquired deformities of the bones and joints.

Mechanical and operative procedures will be given in detail, and prominence will be given to the mechanical requirements for braces and artificial limbs, etc., with description of their methods of construction. A large number of original illustrations will be used to make descriptions clearer.

IN PRESS. READY SHORTLY.

DISEASES OF WOMEN.

By HENRY J. GARRIGUES, A.M., M.D.,

Professor of Obstetrics in the New York Post-Graduate Medical School and Hospital; Gynæcologist to St. Mark's Hospital, New York City; Gynæcologist to the German Dispensary in the City of New York; Consulting Obstetrician to the New York Infant Asylum; Obstetric Surgeon to the New York Maternity Hospital; Fellow of the American Gynæcological Society; Fellow of the New York Academy of Medicine; President of the German Medical Society of New York, etc. etc.

In One Very Handsome Octavo Volume, of about 700 pages, profusely Illustrated by Woodcuts and Colored Plates.

PRICE, CLOTH, $4.00. SHEEP, $5.00.

A practical work on Gynæcology for the use of students and practitioners, written in a terse and concise manner. The importance of a thorough knowledge of the anatomy of the female pelvic organs has been fully recognized by the author, and considerable space has been devoted to the subject. The chapters on operations and treatment will be thoroughly modern, and are based upon the large hospital and private practice of the author. The text is elucidated by a large number of illustrations and colored plates, many of them being original.

SYLLABUS OF OBSTETRICAL LECTURES

In the Medical Department University of Pennsylvania

By RICHARD C. NORRIS, A.M., M.D.,

Demonstrator of Obstetrics in the University of Pennsylvania.

Third Edition, thoroughly revised and enlarged.

PRICE, CLOTH, INTERLEAVED FOR NOTES, $2.00 Net.

The New York *Medical Record* of April 19, 1890, referring to this book, says: "This modest little work is so far superior to others on the same subject that we take pleasure in calling attention briefly to its excellent features. Small as it is, it covers the subject thoroughly, and will prove invaluable to both the student and the practitioner as a means of fixing in a clear and concise form the knowledge derived from a perusal of the *larger text-books.*

NOW READY. SECOND EDITION.

AN OPERATION BLANK,

With List of Instruments, etc.,

REQUIRED IN VARIOUS OPERATIONS.

PREPARED BY W. W. KEEN, M.D., LL.D.,

Professor of the Principles of Surgery in the Jefferson Medical College, Philadelphia.

Price per Pad, containing Blanks for 50 Operations, 50 Cents, net.

A convenient blank, suitable for all operations, giving complete instructions regarding necessary preparation of patient, etc., with full list of dressings and medicines to be used.

Saunders' Question Compends.

Now the Standard Authorities in Medical Literature

WITH

Students and Practitioners in every City of the United States and Canada.

THE REASON WHY!

They are the advance guard of "Student's Helps"—that DO HELP; they are the leaders in their special line, *well and authoritatively written by able men, who, as teachers in the large colleges, know exactly what is wanted by a student preparing for his examinations.* The judgment exercised in the selection of authors is fully demonstrated by their professional elevation. CHOSEN FROM THE RANKS OF DEMONSTRATORS, QUIZ-MASTERS, AND ASSISTANTS, MOST OF THEM HAVE BECOME PROFESSORS AND LECTURERS IN THEIR RESPECTIVE COLLEGES.

Each book is of convenient size (5 by 7 inches), containing on an average 250 pages, profusely illustrated and elegantly printed in clear, readable type, on fine paper.

The entire series, numbering twenty-three subjects, has been kept thoroughly revised and enlarged when necessary, many of them being in their third and fourth editions.

TO SUM UP.

Although there are numerous other Quizzes, Manuals, Aids, etc., in the market, none of them approach the "Blue Series of Question Compends," and the claim is made for the following points of excellence:—

1. Professional standing and reputation of authors.
2. Conciseness, clearness, and standard of text.
3. Size of type, quality of paper and binding.

No. 1.

ESSENTIALS OF PHYSIOLOGY.

By H. A. HARE, M.D.,

Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia; Physician to St. Agnes' Hospital and to the Medical Dispensary of the Children's Hospital; Laureate of the Royal Academy of Medicine in Belgium, of the Medical Society of London, etc.; Secretary of the Convention for the Revision of the Pharmacopœia, 1890.

Crown 8vo., 230 pages, numerous illustrations.

Third Edition, revised and enlarged by the addition of a series of handsome plate illustrations taken from the celebrated "Icones Nervorum Capitis" of Arnold.

Price, Cloth, $1.00 net. Interleaved for notes, $1.25 net.

"Dr. Hare has admirably succeeded in gathering together a series of Questions which are clearly put and tersely answered."—*University Medical Magazine.*

No. 2.

ESSENTIALS OF SURGERY.

CONTAINING, ALSO,

Venereal Diseases, Surgical Landmarks, Minor and Operative Surgery, and a Complete Description, together with full illustrations, of the Handkerchief and Roller Bandage.

By EDWARD MARTIN, A.M., M.D.,

Clinical Professor of Genito-Urinary Diseases, Instructor in Operative Surgery, and Lecturer on Minor Surgery, University of Pennsylvania; Surgeon to the Howard Hospital; Assistant Surgeon to the University Hospital, etc. etc.

Fifth edition. Crown 8vo., 334 pages, profusely illustrated.

Considerably enlarged by an Appendix containing full directions and prescriptions for the preparation of the various materials used in ANTISEPTIC SURGERY; also several hundred recipes covering the medical treatment of surgical affections.

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"Dr. Martin has admirably succeeded in selecting and retaining just what is necessary for purposes of examination, and putting it in most excellent shape for *reference and memorizing.*"—*University Medical Magazine.*

No. 3.

ESSENTIALS OF ANATOMY,

Including the Anatomy of the Viscera.

By CHARLES B. NANCREDE, M.D.,

Professor of Surgery and Clinical Surgery in the University of Michigan, Ann Arbor; Corresponding Member of the Royal Academy of Medicine, Rome, Italy; Late Surgeon Jefferson Medical College, etc. etc.

Fourth edition. Crown 8vo., 380 pages, 180 illustrations.

Enlarged by an Appendix containing over Sixty Illustrations of the Osteology of the Human Body.

The whole based upon the last (eleventh) edition of GRAY'S ANATOMY.

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"Truly such a book as no student can afford to be without."—*American Practitioner and News*, Louisville, Kentucky.

No. 4.

Essentials of Medical Chemistry

ORGANIC AND INORGANIC,

CONTAINING, ALSO,

Questions on Medical Physics, Chemical Physiology, Analytical Processes, Urinalysis, and Toxicology.

By LAWRENCE WOLFF, M.D.,

Demonstrator of Chemistry, Jefferson Medical College; Visiting Physician to German Hospital of Philadelphia; Member of Philadelphia College of Pharmacy, etc. etc.

Fourth and revised edition, with an Appendix. Crown 8vo., 212 pages.

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"We could wish that more books like this would be written, in order that medical students might thus early become more interested in what is often a difficult and uninteresting branch of medical study."—*Medical and Surgical Reporter.*

"The author is thoroughly familiar with his subject. A useful addition to the medical and pharmaceutical library."—*Keystone Pharmacist*, Chicago.

No. 5.

ESSENTIALS OF OBSTETRICS.

By W. EASTERLY ASHTON, M.D.,

Professor of Gynæcology in the Medico-Chirurgical College of Philadelphia; Obstetrician to the Philadelphia Hospital.

Third Edition, thoroughly revised and Enlarged.

Crown 8vo., 244 pages, 75 illustrations.

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"An excellent little volume containing correct and practical knowledge. An admirable compend, and the best condensation we have seen."—*Southern Practitioner.*

"Ashton's Obstetrics. Of extreme value to students, and an excellent little book to freshen up the memory of the practitioner."—*Chicago Medical Times.*

"A work thoroughly calculated to be of service to students in preparing for examination."—*Medical and Surgical Reporter.*

"Ashton's Obstetrics should be consulted by the medical student until he can answer every question at sight. The practitioner would also do well to glance at the book now and then, to prevent his knowledge from getting rusty."—*New York Medical Abstract*

No. 6.

ESSENTIALS OF
Pathology and Morbid Anatomy.

BY

C. E. ARMAND SEMPLE, B.A., M.B., Cantab., L.S.A., M.R.C.P., Lond.,

Physician to the Northeastern Hospital for Children, Harkney; Professor of Vocal and Aural Physiology and Examiner in Acoustics at Trinity College, London, etc. etc.

Crown 8vo., illustrated, 174 pages.

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"An excellent compend of the subject from the points of view of Green and Payne."—*Indiana Medical Journal.*

"A valuable little volume—truly a *multum in parvo.*"—*Cincinnati Medical News.*

No. 7.

ESSENTIALS OF
MATERIA MEDICA, THERAPEUTICS,
AND PRESCRIPTION WRITING.

BY HENRY MORRIS, M.D.,

Late Demonstrator, Jefferson Medical College; Fellow College of Physicians, Philadelphia; Co-editor Biddle's Materia Medica; Visiting Physician to St. Joseph's Hospital, etc. etc.

Second Edition. Crown 8vo., 250 pages.

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"One of the best compends in this series. Concise, pithy, and clear, well suited to the purpose for which it is prepared."—*Medical and Surgical Reporter.*

"The very essence of Materia Medica and Therapeutics boiled down and presented in a clear and readable style."—*Gaillard's Medical Journal.*

"A well-arranged quiz-book, comprising the most important recent remedies."—*Sanitarium*, New York.

"The subjects are treated in such a unique and attractive manner that they cannot fail to impress the mind and instruct in a lasting manner."—*Buffalo Medical and Surgical Journal.*

Nos. 8 and 9.

Essentials of Practice of Medicine.

BY HENRY MORRIS, M.D.,

Author of "Essentials of Materia Medica," etc. etc.

With an Appendix on the Clinical and Microscopical Examination of Urine.

BY LAWRENCE WOLFF, M.D.,

Author of "Essentials of Medical Chemistry," etc.

Colored (Vogel) Urine Scale and numerous fine Illustrations.

Third Edition, enlarged by some THREE HUNDRED Essential Formulæ, selected from the writings of the most eminent authorities of the Medical Profession.

COLLECTED AND ARRANGED BY WILLIAM M. POWELL, M.D.,

Author of "Essentials of Diseases of Children."

Post 8vo., 460 pages. Price, Cloth, $2.00. Medical Sheep, $2.50.

"Of material aid to the advanced student in preparing for his degree, and to the young practitioner in diagnosing affections or selecting the proper remedy."—*Southern Practitioner.*

"The teaching is sound, the presentation graphic, matter as full as might be desired, and the style attractive."—*American Practitioner and News.*

No. 10.

ESSENTIALS OF GYNÆCOLOGY.

By EDWIN B. CRAGIN, M.D.,
Attending Gynæcologist, Roosevelt Hospital, Out-Patients' Department;
Assistant Surgeon, New York Cancer Hospital, etc. etc.

SECOND EDITION.

Crown 8vo., 186 pages, 58 fine illustrations.

Price, Cloth, $1.00. Interleaved for Notes, $1.25

"This is a most excellent addition to this series of question compends, and properly used will be of great assistance to the student in preparing for examination. Dr. Craigin is to be congratulated upon having produced in compact form the Essentials of Gynæcology. The style is concise, and at the same time the sentences are well rounded. This renders the book far more easy to read than most compends, and adds distinctly to its value."—*Medical and Surgical Reporter.*

"Students and practitioners, general or special, even derive information and benefit from the perusal and study of a carefully written work like this."—*College and Clinical Record.*

No. 11.

Essentials of Diseases of the Skin.

By HENRY W. STELWAGON, M.D,
Clinical Lecturer on Dermatology in the Jefferson Medical College, Philadelphia;
Physician to the Skin Service of the Northern Dispensary; Dermatologist
to Philadelphia Hospital; Physician to Skin Department of the
Howard Hospital; Clinical Professor of Dermatology in
the Woman's Medical College, Philadelphia, etc. etc.

SECOND EDITION.

Crown 8vo., 262 pages, 74 illus., many of which are original

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"We are indebted to Philadelphia for another excellent book on Dermatology. The little book now before us is well entitled 'Essentials of Dermatology,' and admirably answers the purpose for which it is written. The experience of the reviewer has taught him that just such a book is needed. We are pleased with the handsome appearance of the book, with its clear type, good paper, and fine woodcuts."—*New York Medical Journal.*

No. 12.

ESSENTIALS OF

Minor Surgery, Bandaging,

AND

Venereal Diseases.

By EDWARD MARTIN, A.M., M.D.,

Author of "Essentials of Surgery," etc.

SECOND EDITION, REVISED AND ENLARGED.

Crown 8vo., 158 pages, 78 illustrations, mostly specially prepared for this work.

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"The best condensation of the subjects of which it treats yet placed before the profession. The chapter on Genito-Urinary Diseases, though short, is sufficiently complete to make them thoroughly acquainted with the most advanced views on the subject."—*Medical News*, Philadelphia.

No. 13.

ESSENTIALS OF

Legal Medicine, Toxicology, and Hygiene.

By C. E ARMAND SEMPLE, M.D.,

Author of "Essentials of Pathology and Morbid Anatomy."

Crown 8vo., 212 pages, 130 illustrations.

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"At the present time, when the field of medical science, by reason of rapid progress, becomes so vast, a book which contains the essentials of any branch or department of it, in concise, yet readable form, must of necessity be of value. This little brochure, as its title indicates, covers a portion of medical science that is to a great extent too much neglected by the student, by reason of the vastness of the entire field and the voluminous amount of matter pertaining to what he deems more important departments. The leading points, the essentials, are here summed up systematically and clearly."—*Southern Practitioner*, Nashville.

"A fair sample of Saunders' valuable compends for the student and practitioner. It is handsomely printed and illustrated, and concise and clear in its teachings."—*Medical Brief*, St. Louis.

No. 14.

ESSENTIALS OF

Refraction and Diseases of the Eye.

By EDWARD JACKSON, A.M., M.D.,

Professor of Diseases of the Eye in the Philadelphia Polyclinic and College for Graduates in Medicine, etc. etc.

AND

Essentials of Diseases of the Nose and Throat.

By E. BALDWIN GLEASON, M.D.,

Surgeon in charge of the Nose, Throat, and Ear Department of the Northern Dispensary; Assistant in the Ear Department of the Philadelphia Polyclinic and College for Graduates in Medicine, etc. etc.

Two vols. in one, crown 8vo., 268 pages, profusely illustrated.

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"A valuable book to the beginner in these branches, to the student, to the busy practitioner, and as an adjunct to more thorough reading. The authors are capable men, and as successful teachers know what a student most needs."—*New York Medical Record.*

No. 15.

ESSENTIALS OF

DISEASES OF CHILDREN.

By WILLIAM M. POWELL, M.D.,

Attending Physician to the Mercer House for Invalid Women, at Atlantic City, N. J.; Late Physician to the Clinic for the Diseases of Children in the Hospital of the University of Pennsylvania and St. Clement's Hospital, etc. etc.

CROWN 8vo., 216 PAGES.

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"This work is gotten up in the clear and attractive style that characterizes the Saunders' Series. It contains in appropriate form the gist of all the best works in the department to which it relates."—*American Practitioner and News*, Louisville, Ky.

"Dr. Powell's little book is a marvel of condensation. Handsome binding, good paper, and clear type add to its attractiveness."—*Southern Practitioner*, Nashville, Tenn.

"The book contains a series of important questions and answers, which the student will find of great utility in the examination of children."—*Annals of Gynæcology*, Philadelphia.

No. 16.

ESSENTIALS OF

EXAMINATION OF URINE.

By LAWRENCE WOLFF, M.D.,
Author of "Essentials of Chemistry," etc.

COLORED (VOGEL) URINE SCALE AND NUMEROUS ILLUSTRATIONS.

Crown 8vo. Price, Cloth, 75 Cents.

"A little work of decided value."—*University Medical Magazine.*

"A good manual for students, well written, and answers, categorically, many questions beginners are sure to ask."—*Medical Record*, New York.

"The book is practical in character, comprehensive as is desirable, and a useful aid to the student in his studies."—*Memphis Medical Monthly*, Memphis, Tenn.

No. 17.

ESSENTIALS OF DIAGNOSIS.

By SOLOMON SOLIS COHEN, M.D.,
Professor of Clinical Medicine and Applied Therapeutics in the Philadelphia Polyclinic,

AND

AUGUSTUS A. ESHNER, M.D.,
Instructor in Clinical Medicine, Jefferson Medical College, Philadelphia.

Post 8vo., 382 pages. 55 Illustrations, some of which are Colored, and a Frontispiece.

Price, $1.50 net.

"A good book for the student, properly written from their standpoint, and confines itself well to its text."—*Medical Record*, New York.

"Concise in the treatment of the subject, terse in expression of fact. . . The work is reliable, and represents the accepted views of clinicians of to-day."—*American Journal of Medical Sciences.*

"The subjects are explained in a few well-selected words, and the required ground has been thoroughly gone over."—*International Medical Magazine.*

"We can heartily recommend this work; it is modern and complete, and will give more satisfaction than many other works which are perhaps too prolix as well as behind the times."—*Medical Review*, St. Louis.

No. 18.

ESSENTIALS OF

PRACTICE OF PHARMACY.

By LUCIUS E. SAYRE,

Professor of Pharmacy and Materia Medica in the University of Kansas.

Crown 8vo., 171 pages.

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"Covers a great deal of ground in small compass. The matter is well digested and arranged. The research questions are a valuable feature of the book."—*Albany Medical Annals*, Albany, N. Y.

"This very valuable little manual covers the ground in a most admirable manner. It contains practical pharmacy in a nutshell."—*American Doctor*, Richmond, Va.

"The best quiz on pharmacy we have yet examined."—*National Drug Register*, St. Louis, Mo.

"A book of only 180 pages, but pharmacy in a nutshell. It is not a quiz-compend compiled to enable a grocery clerk to 'down' a board of pharmacy; it is a finger-post guiding a student to a completer knowledge."—*Western Drug Record.*

No. 20.

Second and Revised Edition.

ESSENTIALS OF BACTERIOLOGY.

A CONCISE AND SYSTEMATIC INTRODUCTION TO THE STUDY OF MICRO-ORGANISMS.

By M. V. BALL, M.D.,

Assistant in Microscopy, Niagara University, Buffalo, N. Y.; Late Resident Physician German Hospital, Philadelphia, etc.

Crown 8vo., 150 pp. 77 Illus. and five Plates, some in Colors.

Price, Cloth, $1.00. - - Interleaved for Notes, $1.25.

"The amount of material condensed in this little book is so great, and so accurate are the formulæ and methods, that it will be found useful as a laboratory hand-book."—*Medical News*, Philadelphia.

"Bacteriology is the keynote of future medicine, and every physician who expects success must familiarize himself with a knowledge of Germ-life—the agents of disease.

"This little book with its beautiful illustrations will give the students, in brief, the results of years of study and research unaided."—*Pacific Record of Medicine and Surgery*, San Francisco.

No. 21.

ESSENTIALS OF

Nervous Diseases and Insanity.

THEIR

SYMPTOMS AND TREATMENT.

By JOHN C. SHAW, M.D.,
Clinical Professor of Diseases of the Mind and Nervous System, Long Island College Hospital Medical School; Consulting Neurologist to St. Catharine's Hospital, and Long Island College Hospital; Formerly Medical Superintendent King's County Insane Asylum.

SECOND EDITION.

Crown 8vo, 186 pages. 48 Original Illustrations.

Mostly selected from the Author's private practice.

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"Clearly and intelligently written."—*Boston Medical and Surgical Journal.*

"A valuable addition to this series of compends, and one that cannot fail to be appreciated by all physicians and students."—*Medical Brief*, St. Louis.

"Dr. Shaw's Primer is excellent as far as it goes, the illustrations are well executed and very interesting."—*Times and Register*, New York and Philadelphia.

No. 22.

ESSENTIALS OF PHYSICS.

By

FRED. J. BROCKWAY, M.D.,
Assistant Demonstrator of Anatomy at the College of Physicians and Surgeons, New York.

Crown 8vo., 320 pages, 155 fine illustrations.

Price, Cloth, - - - - - - - $1.00 net.
Interleaved for Notes, - - - - $1.25 net.

"The publisher has again shown himself as fortunate in his editor as he ever has been in the attractive style and make-up of his compends."—*American Practitioner and News*, Louisville, Ky.

"Contains all that one need know of the subject, is well written, and is copiously illustrated."—*Medical Record*, New York.

"The author has dealt with the subject in a manner that will make the theme not only comparatively easy, but also of interest."—*Medical News*, Philadelphia.

No. 23.

Essentials of Medical Electricity.

By D. D. STEWART, M.D.,

Demonstrator of Diseases of the Nervous System and Chief of the Neurological Clinic in the Jefferson Medical College; Physician to St. Mary's Hospital, and to St. Christopher's Hospital for Children, etc.

AND

E. S. LAWRANCE, M.D.,

Chief of the Electrical Clinic and Assistant Demonstrator of Diseases of the Nervous System in the Jefferson Medical College, etc.

Crown 8vo., 148 pages, 65 illustrations.

Price, Cloth, $1.00. Interleaved for Notes, $1.25.

"Clearly written, and affords a safe guide to the beginner in this subject."—*Medical and Surgical Journal*, Boston.

"The subject is presented in a lucid and pleasing manner."—*Medical Record*, New York.

"A little work on an important subject, which will prove of great value to medical students and trained nurses who wish to study the scientific as well as the practical points of electricity."—*The Hospital*, London, England.

In Preparation. Ready Shortly.

A DOSE BOOK

AND

Manual of Prescription Writing.

By E. Q. THORNTON, M.D.,

Demonstrator of Therapeutics, Jefferson Medical College, Philadelphia.

The volume, in size and general appearance, will be uniform with "Saunders' Pocket Medical Formulary."

IN PREPARATION.

METHODS

OF

PREVENTING AND CORRECTING DEFORMITIES OF THE BONES AND JOINTS.

A Handbook of Practical Orthopedic Surgery.

By H. AUGUSTUS WILSON, M.D.,

PROFESSOR OF GENERAL AND ORTHOPEDIC SURGERY, PHILADELPHIA POLYCLINIC; CLINICAL PROFESSOR OF ORTHOPEDIC SURGERY, JEFFERSON MEDICAL COLLEGE, PHILADELPHIA, ETC., ETC.

The aim of the author will be to provide a book of moderate size containing comprehensive details that will enable general practitioners to thoroughly understand the mechanical features of the many forms of congenital and acquired deformities of the bones and joints.

Such a book might well be called Orthopedic Therapeutics, as it will adopt as a basis the description, symptoms, signs, and diagnosis upon which to elaborate the appropriate details of treatment.

The mechanical functions that are impaired will be considered first as to prevention, as a primary importance, and following this will be described the methods of correction that have been proved practical by the author. Operative procedures will be considered from a mechanical point as well as surgically. Prominence will be given to the latest requirements for braces and artificial limbs, etc., and the application of the methods for constructing the simplest forms, with the use of plaster of Paris, felt, leather, paper, steel, or other material, together with the methods of readjustment to suit the changes occurring during the progress of the case.

An important feature of the book will be the practical application of remedial gymnastics and movements in the prevention or recovery of lost mechanical functions of the muscles when they have produced or tend to produce bone or joint deformities.

A very large number of original illustrations will be used to make descriptions clearer. The elimination of theoretical matters still in dispute will make the book one of practical value to busy physicians, from whom such cases generally receive first attention, and by whom they may be successfully treated.

READY SHORTLY.

LANE MEDICAL LIBRARY

To avoid fine, this book should be returned on or before the date last stamped below.

4. Treatment of disease, illustrated by more than 200 elucidative formulæ.

Explicit directions will be given for prescribing the doses, being in both Apothecaries' and the Metric systems.

Considerable space is devoted to the reliable newer *agents.*

A

DOSE BOOK AND MANUAL

L356 Shaw, J.C. 51285
S53 Essentials of ner-
1894 vous diseases and in-
sanity.

DATE DUE

PRI G.

Demo

The
a sma
to dat
tion o

Gr
partm
made
liable

Th
will b
Formulary.